The Newsweekly for Information Technology Leaders
October 14, 1996, Vol. 30, No. 42, 148 Pages, $3/Copy, $48/Year

COMPUTERWORLD

News updates, features, forums: www.computerworld.com

Mobile users swat at notebook bugs

By Mindy Blodgett and April Jacobs

Mark McWhirter, vice president of information technology at Earle M. Jorgensen Co., thought the tough part of a large laptop and sales force automation deployment would be persuading people to go mobile.

But the biggest hurdle turned out to be the laptops themselves — a shipment of about 230 Texas Instruments, Inc. Extensa 555 and 560 models. Many of them just didn't work, he said.

"One of the more serious problems was that you would go to turn on the machine, and it would say, 'Hard drive error, disk not found,'" McWhirter said. "It's been incredibly annoying."

He isn't alone. Users and industry observers have been complaining for months that vendors, in a rush to meet accelerating and unexpectedly high demand, are shipping laptops that haven't been adequately tested.

Users also face configuration problems when their machines are preloaded with outdated software.

"My theory is that people are rushing oew-generation products out the door without spending as much

Laptop, *page 135*

Laptop sales

International Data Corp. in Framingham, Mass., recently revised its notebook market forecast upward, predicting that 4.7 million notebooks will ship in the U.S. this year, up from 3.5 million last year.

Year 2000 crash course offers IS career payoff

Silver lining

- Hone your management skills
- Work closely with senior managers to show them you understand business as well as technical issues
- Get a valuable and rare overview of your information technology infrastructure and business processes

By Robert L. Scheier

If scare tactics haven't forced you to start fixing your year 2000 problems, maybe this will: Tackling that messy job could help you develop skills you'll need long after the turn of the century.

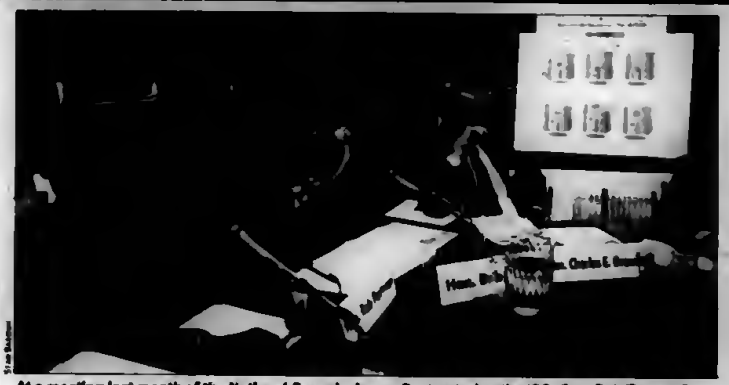
Those information systems skills include project management, an ability to explain highly technical issues in business terms and in-depth knowledge of a company's IS and business processes, said Bruce Hall, a research director at Gartner Group, Inc.

The very size and complexity that make year 2000 fixes so difficult are

Year 2000, *page 135*

Newspaper
8BXBBJFT# ********** CAR-RT SORT ## C035
#4818JUIV3000R0838 JUL 96 001 005338
UNIVERSITY MICROFILMS INT 0000
SERIAL PUBLICATIONS
300 N ZEEB RD 10
ANN ARBOR MI 48103-1500

Special Report:



Steve Bisson

At a meeting last month of the National Commission on Restructuring the IRS, Sen. Bob Kerrey (D-Neb.), center, lambasted the IRS for failing to apply the right performance measures to its operations

IRS project failures cost taxpayers $50B annually

By Gary H. Anthes
WASHINGTON

It may be the most expensive systems development fiasco in history. Delays in overhauling the federal tax systems are costing the U.S. Treasury as much as $50 billion per year, a *Computerworld* investigation has found.

That figure represents what the federal government *could be* collecting in additional taxes if the Internal Revenue Service had succeeded in its decade-long attempt to modernize its 1960s-era computer systems.

Now trying for the third time to revamp its tax collection systems, the IRS spends hundreds of millions of dollars annually on the effort. But critics say much of that money is wasted through mismanagement and primitive development practices. And IRS officials concede many of those points.

Yet direct expenditures on the IRS' $8 billion Tax Systems Modernization program pale beside a less-noticed cost: the revenue that might have been.

The IRS admits that the lack of progress in developing new automated compliance tools stands in the way of its goal to boost tax collections

IRS, *page 28*

INSIDE

- The IRS wants more credit for its successes. Page 28.
- Election-year attacks put focus on the tax agency's budget. Page 29.
- Time line traces three decades of tax systems modernization projects. Pages 28 and 29.
- Corporate IS offers advice on avoiding similar mega-project fiascos. Page 30.
- TSM unplugged – a look at the project's key players and price tags. Page 30.

In 1995, the IRS:

Jack Dykinga

- Paid out $106 billion in refunds
- Processed 206 million tax returns
- Spent $25.6 billion overall
- Spent $622 million on Tax Systems Modernization projects

VOL 30
ISS 42
OC 14 1996

UMI

The Newsweekly for Information Technology Leaders
October 14, 1996, Vol. 30, No. 42, 148 Pages, $3/Copy, $48/Year

COMPUTERWORLD

News updates, features, forums: www.computerworld.com

Mobile users swat at notebook bugs

By Mindy Blodgett and April Jacobs

Mark McWhirter, vice president of information technology at Earle M. Jorgensen Co., thought the tough part of a large laptop and sales force automation deployment would be persuading people to go mobile.

But the biggest hurdle turned out to be the laptops themselves — a shipment of about 230 Texas Instruments, Inc. Extensa 555 and 560 models. Many of them just didn't work, he said.

"One of the more serious problems was that you would go to turn on the machine, and it would say, 'Hard drive error, disk not found,'" McWhirter said. "It's been incredibly annoying."

He isn't alone. Users and industry observers have been complaining for months that vendors, in a rush to meet accelerating and unexpectedly high demand, are shipping laptops that haven't been adequately tested.

Users also face configuration problems when their machines are preloaded with outdated software.

"My theory is that people are rushing new-generation products out the door without spending as much

Laptop, *page 135*

Laptop sales

International Data Corp. in Framingham, Mass., recently revised its notebook market forecast upward, predicting that 4.7 million notebooks will ship in the U.S. this year, up from 3.5 million last year.

Year 2000 crash course offers IS career payoff

Silver lining

Year 2000 conversion projects are a great opportunity to:

- Hone your management skills
- Work closely with senior managers to show them you understand business as well as technical issues
- Get a valuable and rare overview of your information technology, infrastructure and business processes

By Robert L. Scheier

If scare tactics haven't forced you to start fixing your year 2000 problems, maybe this will: Tackling that messy job could help you develop skills you'll need long after the turn of the century.

Those information systems skills include project management, an ability to explain highly technical issues in business terms and in-depth knowledge of a company's IS and business processes, said Bruce Hall, a research director at Gartner Group, Inc.

The very size and complexity that make year 2000 fixes so difficult are

Year 2000, *page 135*

Newspaper
#BXBBJFT# ********** CAR-RT SORT ** C035
#48103UIU300SR003# JUL 96 001 005330
UNIVERSITY MICROFILMS INT 0000
SERIAL PUBLICATIONS
300 N ZEEB RD 10
ANN ARBOR MI 48103-1500

Special Report: TAX SYSTEMS FIASCO

At a meeting last month of the National Commission on Restructuring the IRS, *Sen. Bob Kerrey (D-Neb.), center, lambasted the IRS for failing to apply the right performance measures to its operations*

IRS project failures cost taxpayers $50B annually

By Gary H. Anthes
WASHINGTON

It may be the most expensive systems development fiasco in history. Delays in overhauling the federal tax systems are costing the U.S. Treasury as much as $50 billion per year, a *Computerworld* investigation has found.

That figure represents what the federal government *could be* collecting in additional taxes if the Internal Revenue Service had succeeded in its decade-long attempt to modernize its 1960s-era computer systems.

Now trying for the third time to revamp its tax collection systems, the IRS spends hundreds of millions of dollars annually on the effort. But critics say much of that money is wasted through mismanagement and primitive development practices. And IRS officials concede many of those points.

Yet direct expenditures on the IRS' $8 billion Tax Systems Modernization program pale beside a less-noticed cost: the revenue that might have been.

The IRS admits that the lack of progress in developing new automated compliance tools stands in the way of its goal to boost tax collections

IRS, *page 28*

INSIDE

■ The IRS wants more credit for its successes. **Page 28.**

■ Election-year attacks put focus on the tax agency's budget. **Page 29.**

■ Time line traces three decades of tax systems modernization projects. **Pages 28 and 29.**

■ Corporate IS offers advice on avoiding similar mega-project fiascos. **Page 30.**

■ TSM unplugged – a look at the project's key pieces and price tags. **Page 30.**

In 1995, the IRS:

JOEL BOWER

- Collected $1.4 trillion in taxes
- Paid out $106 billion in refunds
- Handled 2 billion pieces of paper (a stack 200 miles high)
- Processed 206 million tax returns
- Assisted 110 million taxpayers by telephone
- Spent $25.6 billion overall
- Spent $1.6 billion on information systems overall
- Spent $622 million on Tax Systems Modernization projects

Steve Wood

Seymour Cray 1925-1996

"Seymour's supercomputers allowed [us to find] cures for disease, made air and suto travel safer, improved our ability to predict and prepare for nature's worst disasters and ended the Cold War." — *Bo Ewald, president and chief operating officer, Cray Research, Inc., a subsidiary of Silicon Graphics, Inc.*

***

"Since 1960, Seymour has given us the recipes for building computers that will continue well into the 21st century. The regret I feel, beyond his loss, is not being able to see his next machine." — *Gordon Bell, inventor of the VAX minicomputer*

***

"Seymour's philosophy for hiring recent college graduates, people not yet bound by ... limits ... gave many young people the opportunity to create and innovate much of today's technology." — *Larry Ellison, CEO, Oracle Corp.*

***

"So many of his ideas have been seminal to almost all computing systems large and small. ... He had an incredible knack for developing high-performance systems with slow components. He was a master of architecture." — *Tom Pyke, director of high performance computing and communications, National Oceanographic and Atmospheric Administration*

***

"He inspired people aesthetically. His inventions were beautiful — it was not just engineering. He had a certain elegance aod integrity to his design." — *Danny Hillis, co-founder, Thinking Machines Corp.*

***

"Seymour Cray was a visionary in the purest sense, having the ability to conceive new solutions and the courage oot to waver from his convictions." — *Scott McNealy, chairman, Sun Microsystems, Inc.*

The 5th Wave by Rich Tennant

Java top guns seek glory, not gold

By Julia King

Rumors of Java developers snagging salaries and signing boouses of $200,000 and more are just that: rumors.

Demaod for Java talent is sky-high, but the kind of money most Java developers earo won't buy them a spot at Millionaire Acres — at least not immediately.

More than money, the near-term paybacks are the learning opportunities, adrenaline rush and sense of professional elitism that come with working on some of the industry's more leading-edge, high-profile projects.

Consider the case of Jay Jsnarthanan, 25, who took a 50% pay cut to eara $500 per day working on a Java project at Nortel, Inc. in Ottawa. Janarthanan had been a consultant in New York and California, earning between $800 and $1,000 per day.

"The project we are doing at Nortel is putting Java in a cell phone, which is pretty interesting and a highly visible project," Janarthanan said. "With Java being a new technology, there's a lot of experimentation and things to learn. Being on a project like this lets you do that. And once it's done, I can actually show people the cell phone."

Jay Janarthanan enjoys the learning opportunities that come with his Java work

Hands-on

Money also was a secondary coasideration for Chris Laurel, a 25-year-old Java developer at Dimension X, Inc., a San Francisco-based company that specializes in Java-based multimedia software.

The firm tapped in to the Internet to recruit Laurel from his home in Minnesota.

"It was very important just to get a project that I could sort of ruo with on my own and completely define from the beginning," Laurel said.

What he ultimately came up with is Liquid Reality, a Java-based software tool that has become the standard for creating three-dimensional pages oa the World Wide Web. Yet Java skills alone won't win developers a coveted spot on leading-edge projects, employers said.

Far more important are an excellent knowledge of and experience in object-oriented software design.

"Java is a programming language, and in that regard, it's not that big of a deal. But knowing about object-oriented [design], plus Java, makes you very valuable," said Frank Greco, CEO of Crossroads Technologies, Inc., a systems integrator in New York.

News Shorts

Temps win court ruling

The 9th Circuit U.S. Court of Appeals last week ruled that several hundred temporary workers hired by **Microsoft Corp.** beteeco 1987 and 1990 are eligible for 401(k) and stock purchase benefits, even though they had signed agreements waiving them. Microsoft has until Oct. 24 to appeal the ruling. If the ruling stands, Microsoft — and virtually any company that employs temporary cootractors to supplement full-time personnel — could end up paying millions of dollars in back benefits to freelance workers.

Microsoft movies

Separately, **Microsoft** announced that it will bundle Microsoft Camcorder, a recorder and playback utility designed to let Office 97 users create and distribute audio and video files, with its forthcoming version of Office 97. Users who receive a stand-alone Camcorder .EXE file can play back the movie screen-capture eveo if they don't have Microsoft Camcorder installed on their machine.

Health care interface

The Andover Working Group, an Andover, Mass.-based coalition of more than 130 technology vendors and health care companies, has released to its members the first in a series of HL7 specifications. HL7, or Health Level 7 Enterprise Communication Framework software, is a set of system interfaces designed to make it easier to transmit text-based data among health care applications. **Hewlett-Packard Co.** established The Andover Working Group in March.

Insurance over the 'net

Intuit, Inc.'s Quicken InsureMarket (www.insuremarket.com) will begin offering real-time rate quotes and online sales of term life insurance through the Internet later this year.

AS/400 shrinks

IBM last week unveiled an entry-level version of the AS/400 for small departments and businesses. Due in November, the 64-bit AS/400 Advanced Entry will cost $7,995, offer a smaller size than oormal AS/400s and include the DB2 relational database and decision-support utilities, wireless LAN and printing software. Company officials said the aim is to let small businesses grow easily with this machine rather than depend on PC servers for their procesing needs.

Terrorism bill made law

President Clinton last week signed into law an aviation bill that authorizes a passenger profiling computer database as an anti-terrorism measure. The provision will allow airlines to compare computer information, such as names, addresses and travel history, with government informatioo on suspected terrorists. Privacy and civil liberties groups have criticized the provision, calling it a dangerous and unnecessary intrusion [CW, Oct. 7].

Lotus organizes Web

Lotus Development Corp. last week announced Lotus Organizer 97 Web Calendar. The software lets users, as well as colleagues they have approved, access their Organizer information from a Web browser. The features can be added at no cost to any user's Web browser. Support for Lotus' group scheduling features found in Notes 4.5 will be available next year.

Business Process Views

Now that you can view IT resources from a business perspective, you'll make smarter decisions in less time

Call 1-800-654-6118 For A Free TNG Video
And To Register For A Seminar.
Or Visit Us At http: www.cai.com

COMPUTER ASSOCIATES

New CA-Unicenter TNG

A PUBLICATION OF IDG

In This Issue

Oct. 14, 1996

News

NEWS

6 **Unconnected**
Oracle database will let network computer users work off-line.

8 **WAN disconnect**
Frame-relay users are frustrated by lack of data on usage.

8 **Point, click, sell**
FedEx/AT&T link will provide electronic commerce services.

10 **Apple-picking season**
Apple hopes new PowerBooks, PDAs will feed fall sales.

OPINION

33 **CIO/CEO relations**
Whom CIOs should report to is a hotter issue than ever, Michael Schrage says.

137 **Closing Windows**
David Coursey says Netscape should drop the platform-neutrality routine.

137 **Thin brew**
If Java's so hot, where are all the applications? Charles Babcock goes hunting.

Technical Sections

SERVERS & PCS

41 **Sun-burst**
Sun bolsters server line with clustering.

SOFTWARE

51 **Talk stock**
Wall Street turns to Java for financial applications.

61 **Can we talk?**
New APIs may let document management systems interoperate.

96 **Office what?**
Many users plan to pass on Microsoft's Office 97, for now.

THE ENTERPRISE NETWORK

63 **WAN plan**
Some users coerce carriers into building them big-pipe wide-area networks; others build their own.

68 **Power up**
Deregulated utilities begin to offer telecommunications services.

THE INTERNET

73 **Up in lights**
Webmaster makes leap from Broadway to cyberspace in one easy bound.

CORPORATE STRATEGIES

85 **I see you**
Desktop videoconferencing set to take off.

88 **Dialing for dollars**
Schwab saves thousands with phone-based stock service.

Features

MANAGING

92 **Get to know Bob**
There are plenty of reasons to get to know Robert J. "Bob" Herbold, former CIO at Procter & Gamble and now the No. 3 man at Microsoft.

IN DEPTH

105 **Reuse regimen**
Four steps to firmer, fitter code.

CAREERS

111 **Smalltalk**
Smalltalk programmers take note: Hiring managers are speaking your language.

112 **IS leaders**
Measure your IS leadership potential.

Etc.

Company index ____ 133
Editorial/Letters ____ 32, 40
F.Y.I. ____ 93, 94
How to contact CW ____ 133
Inside Lines ____ 138
Stock Ticker ____ 131

Hardware pioneer Seymour Cray dies

By Gary H. Anthes

Tribute

For Seymour R. Cray, the goal was simply stated, if not always easily met: "to make the fastest computers in the world."

And that's just what he did, starting in a St. Paul, Minn., glider factory in 1951 and ending 45 years later in Colorado Springs.

Cray, 71, died Oct. 5 from head injuries received in an automobile accident two weeks earlier.

To see Cray's achievements in strictly quantitative terms — the fastest computers — overlooks the huge contribution he made to a discipline he helped create.

"Computational science" grapples with the problems that as a practical matter can't be solved by conventional computers.

For example, it doesn't do much good to develop a 12-hour weather forecast if it takes 24 hours of computer time to do it.

Seymour Cray didn't seem to care much about weather forecasting, petroleum exploration or the design of drugs, cars and nuclear weapons — all of which he influenced considerably. To him, the name of the game was creating lightning-fast hardware, not applications.

The amiable but intensely private computer designer was the quintessential nerd. He once told of how, as an engineering student at the University of Minnesota, he had been ribbed for using a circular slide rule because nearly everyone else used the "straight stick" kind.

Seymour Cray: ***If you keep trying, you will occasionally do something worthwhile'***

But that willingness to buck conventional practices was the key to Cray's success over the years.

In a rare interview two years ago, he told *Computerworld*, "You have to be prepared to fail, and I have failed about half the time, I guess. But you simply have to pick yourself up and go at it again with whatever insights you've gained from failure. If you do keep trying, you will occasionally do something worthwhile."

His string of successes ended in the early 1990s after he left Cray Research to start Cray Computer Corp. Believing silicon processors would soon reach their performance limits, Cray cast his lot with the much faster gallium arsenide.

But the processors were difficult to manufacture, and Cray wasted years and hundreds of millions of dollars. And the demand for supercomputers plunged in post-Cold War years.

Cray said the secret to making computers faster was to make them smaller.

He speculated that molecular-size circuits built by biological processes might hold promise for huge improvements in computer performance. "How do we train bacteria to make transistors?" Cray wondered. He wasn't joking.

When asked if he might soon retire, he said, "That frightens me. I will work as long as I am able."

The work of the legendary computer designer has come to a tragic end. But we will recall Seymour Cray every time we drive a car, fly in an airplane, take a modern medicine or dodge a hurricane.

Internet

All the Web's a stage

Andy McGibbon worked backstage off-Broadway for years. Now, as webmaster at Playbill magazine, the stars come to watch his work.

See page 73.

COMPUTERWORLD

COME VISIT OUR WEB SITE

[redacted]

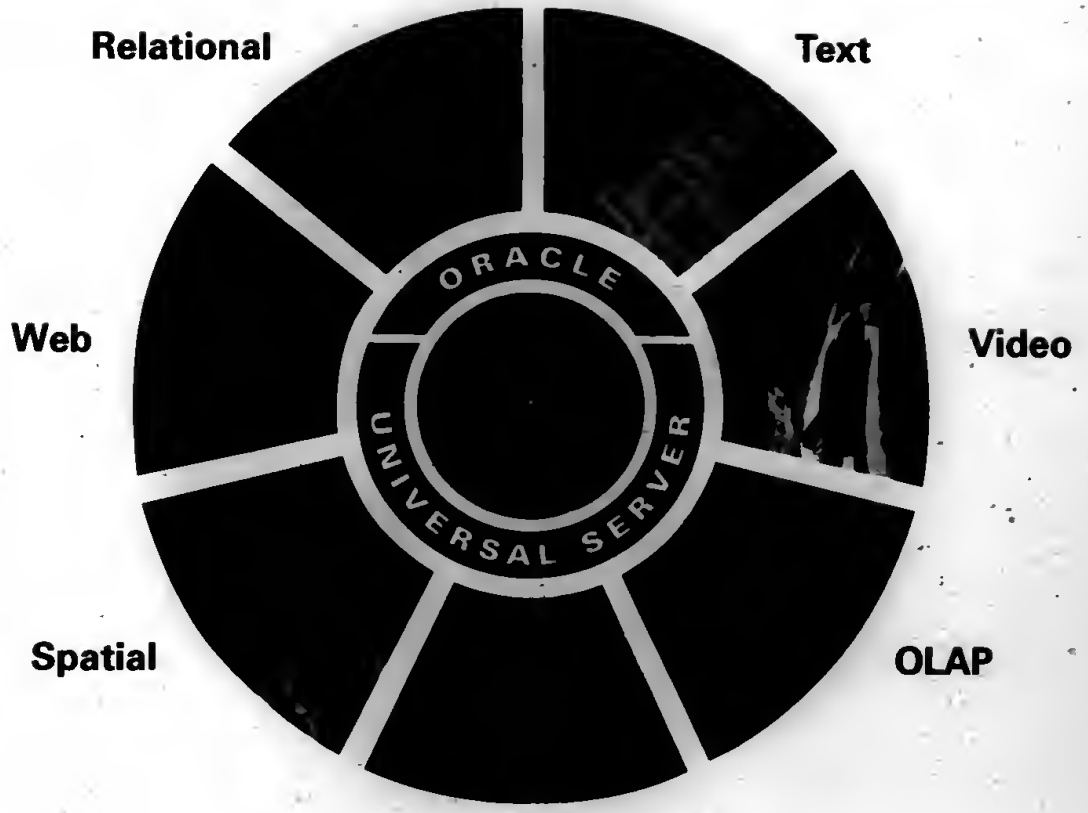
Too busy doing transactions on the 'net to search for information about electronic commerce? We've put it all together for you — profiles, trends, technology explainers and more.

Buyer's Guide: Firing Line

Users discuss Oracle's strategy to connect intranets to corporate databases. So far, customers like it.

[redacted]

Oracle Universal Server
Manage All Your Information



Only Oracle® Universal Server® allows you to easily manage all your data: relational, spatial, text; image, audio and video. By giving you integrated access to any data type, Oracle Universal Server provides the enabling technology for applications ranging from data warehousing and transaction processing, to web-enabled electronic commerce and messaging systems.

Oracle Universal Server: any computer, any data, any application, anywhere. For more information, Call Oracle at 1-800-633-1071, ext. 10240 or find us on the Web at http://www.oracle.com

ORACLE®
Enabling the Information Age™

REGISTER NOW.

www.oracle.com/openworld

©1996 Oracle Corporation. Oracle and Oracle Universal Server are registered trademarks, and Enabling the Information Age is a trademark of Oracle Corporation. All rights reserved. All other company product names are trademarks of their respective owners.

Thin clients unplugged

Oracle plans database for network computers that aren't on a network

By Craig Stedman

Network computers may not be just for networks after all, if Oracle Corp. has its way.

One of the most fervent of the network computer prophets, Oracle is developing a network computer version of its single-user database that would let users do some work while disconnected from the network.

But such a move goes against the grain of the network computing concept, several users and analysts said last week.

Officials at other companies that are developing thin clients, including IBM, Sun Microsystems, Inc. and HDS Network Systems, Inc., said devices with some disconnected capabilities aren't completely out of the question. But for now, they said, corporate interest in network computers is expected to come from customers who view the devices as the dumb terminals of the 1990s.

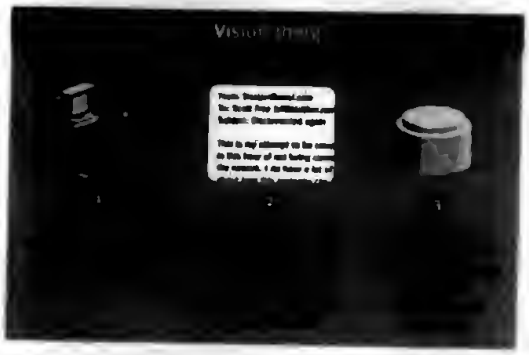
The network computer release of Personal Oracle Lite should be ready next year, Oracle officials said.

End users with such a database could download data and Java applets to their network computers and do basic processing while disconnected from the network. That would make it conceivable to have mobile or handheld network computers that would be less expensive to buy and support than full-fledged laptop computers, according to Oracle's vision.

Michael Anthony Jewelers, Inc. is one prospective user that wants network computers to have as few capabilities as possible beyond the network, said Kalman Shor, assistant director of information services at the Mount Vernon, N.Y., jewelry manufacturer.

"The reality of the way we do business sort of dictates that for us," Shor said. "A lot of the people here aren't very computer-savvy, and we're talking about gold bullion walking into this place and gold jewelry walking out. Even with our data, we want to keep close track of what's here."

Michael Anthony's PCs run Windows 3.1 off a server rather than having individual copies, and network devices would replicate that setup "with less cost up front and less of a box to get destroyed in the manufacturing environment," Shor said. The company is considering installing about 100 of IBM's upcoming Network Station terminals, he said.



Other observers said a network computer with a database would also need local storage — which would make it look awfully similar to a PC.

"I'm not exactly sure how to differentiate between a mobile [network computer] and a laptop," said Frank Tait, a vice president at SCT Education Systems. The Malvern, Pa., software vendor plans to support network computers and use them internally as replacements for low-end PCs and Macintoshes.

A new Windows version of Personal Oracle Lite, to be announced this week, requires 1M byte of memory and 5M bytes of hard-disk space. Oracle officials said they haven't decided whether the network computer version of the database would be stored on a disk or an alternative medium such as flash memory.

Network devices hot topic at Unix Expo

By Laura DiDio
and Jaikumar Vijayan
NEW YORK

That old X terminal never did catch on, but at last week's Unix Expo Plus in New York, attendees were starting to get excited about its direct descendant — a network computer attached to a Unix file server.

The idea of low-cost network access devices originated 10 years ago with X terminals, but the concept never went anywhere because potential users were scared off by Unix's "technical complexity," said Eileen O'Brien, an analyst at International Data Corp. in Framingham, Mass.

But the price advantage of a $500 network device, combined with the scalability, reliability and security of Unix, could make it a viable alternative to PC-based networks in certain situations, users and analysts said.

Easy sell

"They were an easy sell here," said Jim Hogan, manager of information systems at Gambro Healthcare, Inc. in Lakewood, Colo., a maker of kidney dialysis machines. Gambro three years ago bought 50 Tektronix, Inc. NetStations with Windows emulation software to attach to its Hewlett-Packard Co. HP-UX servers.

"The total cost was $150,000. If we had opted to buy PCs for all of our engineers, it would have cost $1.5 million," Hogan said. It also resulted in a "drastic time-savings" for Hogan and his network administrators because they had to configure only one server.

Greg Blatnick, vice president at Zona Research, Inc. in Redwood City, Calif., said Hogan's experience is typical.

"Unix vendors are making a very legitimate case. A thin client on the desktop eliminates the need to upgrade systems with ever-burgeoning amounts of memory and storage capacity, which can get very expensive in large environments," he said.

Some large organizations, including Federal Express Corp., R. R. Donnelly & Sons Publishing Corp., Wells Fargo Bank, Bank of America and the University of Washington Medical Center, have either already adopted network computers with their Unix servers or are testing them with an eye toward deployment, Blatnick said.

Network computing

Tom Boos, senior vice president at R. R. Donnelly in Chicago, said the firm is building a thin-client, Java-based network that provides "portability across Windows, Macintosh and OS/2 workstations and applications."

"We're definitely considering it for some of our sites, though we haven't made a definite commitment yet," said an MIS manager at Federal Express in New York, who requested anonymity. "We have tens of thousands of users, and everyone is screaming for Internet access, which means we have to upgrade all our desktops. We'd be crazy not to at least look at them."

Other users were hesitant. Rob Young, a software engineer at Vu/Text Library Services, Inc. in Philadelphia, said network computers require much higher network bandwidth. Otherwise "the network becomes the bottleneck," he said.

"So instead of paying to maintain PCs, you end up paying through the nose to keep the network running," Young said.

Save the servers

James Garden, an analyst at Technology Business Research, Inc. in Hampton, N.H., said users who exchange their fat desktop PCs for thin clients still need fat Unix servers to carry the application load.

Still, Garden and Blatnick said the demand for Internet access could help spur the adoption of thin clients. "The Web is becoming the cross-platform application delivery and access vehicle, especially in legacy environments. Businesses could build Web interfaces on top of these applications. This would let users access legacy applications via Web browsers using PCs, laptops and thin clients. This trend will certainly support the push toward thin clients," Garden said.

The biggest barrier facing the thin clients, though, could come from end users. "It's going to be a tough sell convincing users to give up the freedom to control their desktops after so many years," Blatnick said.

Corrections

Due to an editing error, the story "Browser rouser" [CW, Aug. 26, page 1] incorrectly stated that Intuit, Inc. lost an antitrust suit against Microsoft Corp. Rather, Microsoft called off its proposed $2 billion acquisition of Intuit in May 1995 in the face of what could have been a lengthy antitrust trial with the U.S. Department of Justice.

Due to a reporting error, a story on page 28 of *Computerworld*'s Sept. 16 issue about System/390 hardware and storage subsystems misstated the capacity available in Ramac 3 disk arrays. It is actually 363G bytes.

A story on page 8 of *Computerworld*'s Sept. 23 issue misstated the outsourcing relationship between Prudential Insurance Company of America and Integrated Systems Solutions Corp. (ISSC). ISSC will maintain the mainframe legacy applications now managed by Prudential's application development offices. Prudential will continue to run its data centers.

Frame-relay users police carriers

By Patrick Dryden and Kim Girard

Frustrated users of frame-relay services are driving carriers to improve the thoroughness and timeliness of reports about these vital links among remote sites.

The packet-switching technology provides a cost-effective way to carry diverse traffic across wide-area networks through its speed, reduced overhead and flexible subscription levels.

But many users complain they can't tell from the limited or late information provided by carriers if they are paying for the appropriate level of service and provisioning circuits according to users' needs.

Savvy users have sought their own monitoring tools so they wouldn't have to negotiate for additional chunks of frame-relay capacity blindly and painfully as their WAN traffic fluctuates.

Mercer Management's Patrick Brennen *says independent monitoring tools help him understand utilization*

AT&T Corp., MCI Communications Corp. and Sprint Corp. told *Computerworld* they are evaluating whether to adopt such tools to expand the information they provide to customers. And each plans to make usage information accessible via the World Wide Web early next year.

"They finally recognized how these tools can help them monitor their service and be more responsive to customers," said Scott Meyers, network operations manager at Cargill, Inc. in Minneapolis.

The agricultural supplier adopted tools for real-time monitoring of its global links. Instead of receiving reports after the fact, Meyers wants to troubleshoot connection problems while on the telephone with remote sites. And he needs more complete statistics than those carriers provide.

"This helps me police the carriers," Meyers said. "Now I can make sure AT&T and MCI truly deliver the contracted service."

Another watchdog is Buck Consultants, Inc. The New York-based benefits consulting firm discovered it had paid for a committed information rate but received less capacity, said Clem Bowen, systems programmer at the firm.

To augment weekly reports from AT&T, Bowen scans circuit usage with more informative tools. He said he looks forward to the day when carriers provide "dynamic information on circuit usage that I don't have to download and print."

No carrier has provided adequate information on actual usage, said Tom Reinsel, telecommunications analyst at Eli Lilly and Co. in Indianapolis.

"We must have a reality check when we purchase lines to know if we're getting our money's worth," Reinsel said.

Independent monitoring tools "help me understand utilization in ways that I couldn't get from the carrier," said Patrick Brennen, network operations manager at Mercer Management Consulting, Inc. in New York.

Reinsel said he can control costs by detecting underutilized circuits. And when rolling out new applications, he said, he needs to watch for overutilization, which can drag down response time for users.

Carriers say there is high demand for better and faster reporting on utilization. But they aren't sure if users will pay for reports or tolerate impact on service.

Users maneuver to open WAN bottlenecks. See page 63.

BE A WINNER WITH...

FDRREORG® using the Parallel backup option compared to FDRREORG Serial backups for VSAM and IAM files.

YOUR IDCAMS backups and reorganization typically require TWO to THREE *times* the elapsed time and TWICE the CPU time of FDRREORG.

FDRREORG's High Performance and Significant Savings

- **Service Bureau** replaced their PDS compression and VSAM backup product with FDRREORG and saved over **$10,000** a year.
- **Federal Government Site** replaced their PDS compression product with FDRREORG. Innovation MSU pricing for their 9221 CPU resulted in an annual rental savings of over **$7,000** a year.

FDRREORG PDS Compression Features give you the advantage

- 50 - 98 % elapsed time savings compared to IEBCOPY
- IEBCOPY Intercept
- Flexible selection criteria
- Directory expansion
- Support for emptying Linklist data sets

User compressed 479 data sets - Saving 93.8% elapsed, 95.8% cpu; 95.8% excps.

SATISFACTION GUARANTEED: Innovation offers a **FREE** No-Obligation 90-Day Trial.

INNOVATION® DATA PROCESSING

CORPORATE HEADQUARTERS: 275 Paterson Avenue, Little Falls, New Jersey 07424 • (201) 890-7300
Fax (201) 890-7147 • **E-mail: 76322.2076@compuserve.com** • **http://www.innovationdp.fdr.com**

EUROPEAN OFFICES:	FRANCE	GERMANY	NETHERLANDS	UNITED KINGDOM	NORDIC COUNTRIES
	01-47-69-15-15	089-489-0210	036-534-1660	0181-905-1266	+31-36-534-1660

Oracle joins Internet server wars

By Craig Stedman
and Mitch Wagner

Oracle Corp. this week is slated to announce an electronic commerce server, and it plans to Web-enable its full line of client/server applications.

Oracle's merchant server, code-named Project Apollo, will let companies tap the Internet to sell goods, information and services. It is supported by several Internet application vendors that are developing plug-in modules that use Oracle's "cartridge" technology.

Sources said those vendors include VeriFone, Inc., which is linking its electronic-payment software to the Oracle merchant server.

Millipore Corp., a Bedford, Mass., maker of liquid and gas filtration equipment, plans to use Oracle's technology to let its customers get information — and eventually transact business — via the Internet.

Electronic commerce

Kevin Danehy, manager of workgroup computing at Millipore, said Oracle has developed some "rather savvy applications" that will open up the company's price, availability and shipment-tracking databases to customers who have World Wide Web browsers.

"We want to give our customers the ability to do simplistic things themselves and take that burden off of our sales force," Danehy said. After an initial test period, Millipore may take advantage of Oracle's order-entry capabilities that use a drag-and-drop shopping cart interface, he said.

Oracle last week declined to comment on the upcoming announcement.

Industry sources said Project Apollo will ship this quarter. It is expected to support Oracle's WebServer software with Oracle7 as the back-end database. The merchant server works with Oracle's object-based Network Computing Architecture for connecting clients to distributed servers and databases, the sources said.

Front-end capability

Meanwhile, Oracle also will announce plans to open up its application suite to access from Java-enabled Web browsers. Any browser-equipped device, including network computers, intelligent telephones and handheld devices, will be able to function as an Oracle front end, company officials said.

The merchant server will put Oracle in heavy competition with Microsoft Corp., Netscape Communications Corp., IBM and other vendors that have already laid out their electronic commerce plans.

But industry observers said Oracle's database technology and market dominance should hold it in good stead.

"Oracle is fairly well ahead of the game in understanding what the issues are that customers will face as they try to put up electronic commerce sites," said Ted Julian, an analyst at International Data Corp. in Framingham, Mass.

Web-hosting services expand

By Mitch Wagner

Looking for a friendly big buddy to help you cross the information highway?

A couple of big companies auditioned for the role last week.

Federal Express Corp. said it will offer electronic commerce services to help its customers sell products that FedEx will then also ship.

Earlier, AT&T Corp. announced plans to expand its hosting service on the World Wide Web with built-in technology to accept credit-card payments and enhanced ties to companies' legacy electronic-mail systems.

AT&T and FedEx are among a busload of major vendors that offer electronic commerce services for Internet-hungry users.

For example, IBM recently announced Web-hosting services, including payment processing. And MCI Communications Corp. announced a similar program in the spring.

Teaming up with a corporate megalith has its advantages over going it alone or working with a smaller vendor, said Chris Pizey, webmaster at Universal Press Syndicate in Kansas City, Mo. Universal Press uses MCI to host its Web site (www.uexpress.com).

Big advantages

A big vendor can offer access to services, technology and high-bandwidth connections that a smaller vendor would have difficulty matching. "Being part of a bigger picture has been better for us," Pizey said.

The FedEx offer may solve some of the major problems consumer companies have bad getting on the Internet — problems that have nothing to do with technology.

Many retail companies that depend on brick-and-mortar stores don't have a fulfillment system to take orders remotely and then ship a product to a customer. Catalog companies on the Web, such as Lands' End, Inc., don't face that problem.

FedEx will set up a company's Web catalog and run it on a Web server located at FedEx headquarters in Memphis. The company will also handle shipments — either by maintaining an inventory of items at a FedEx warehouse or by linking to a server that FedEx will install at the corporate customer's warehouses. The FedEx server will address and print out a shipping label for the corporate customer.

The FedEx service is scheduled to be available in the first half of next year. Pricing hasn't been determined, although FedEx officials said the company probably won't charge a monthly service fee, just a setup cost and a percentage of sales royalties.

AT&T expands digital cellular phone service. See page 66.

Online guarantees

AT&T

- A Web site hosting service offering payment processing.
- Cost: $500 to $5,000 per month.
- Never-miss-an-order cash-back guarantee to corporate users.
- Consumers will be indemnified against fraud that occurs at an AT&T site while using the AT&T Universal credit card.

America Online

- Will indemnify consumers for the complete amount of any fraud that occurs as a result of using any credit card on an AOL site, in cases where the card issuer doesn't cover the fraud itself.

Lucent broadens reach with Agile acquisition

By Kim Girard

Lucent Technologies, Inc., with its pending acquisition of LAN switch maker Agile Networks, Inc., aims to shed its image as a private branch exchange supplier for that of a one-stop networking shop.

For customers, the deal, expected to close tomorrow, brings a big contender closer to offering end-to-end voice and data networks. But some users question whether the AT&T Corp. spin-off is nimble enough to compete in a rough-and-tumble market.

At a glance

Lucent is expected to acquire Agile Networks for roughly $100 million, according to one analyst

Company	Technology	Number of employees	Revenue
Lucent Murray Hill, N.J.	Voice PBX supplier	125,000	$5.3 billion in Q2 1996
Agile Networks Boxboro, Mass.	LAN switch maker	60	$7 million in fiscal 1996

Lucent first moved in July to boost its profile as a network provider by signing an agreement under which it would resell equipment from Bay Networks, Inc. Lucent uses Bay's routing software in its own products and resells its switching and network management software.

Wally Knapp, director of computer services at Catonsville College in Catonsville, Md., said he was skeptical about Lucent's prospects as a full-service vendor.

Lucent "tried it all before" as a part of AT&T with NCR Corp. computers and Paradyne networking gear, said Knapp, a Bay Networks user. "Simply because they have the wires and boxes doesn't mean anything at all," he said.

Lucent is buying Agile, a privately held LAN switch maker in Boxboro, Mass., that has 60 employees, for its virtual LAN (VLAN) software and Asynchronous Transfer Mode technology, said Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington.

VLAN technology lets information systems managers create logical workgroups regardless of where users are located on a network. Lucent officials said the firm plans to integrate Agile's VLAN technology across its product line and use Agile network management software with its OneVision management system.

But there is some overlap between the Agile products that Lucent is acquiring and those that Lucent resells from Bay Networks, notably Bay's larger switches.

Bay Networks answers 3Com Ethernet switch offering. See page 66.

You won't just go faster. You'll go faster, all the time.

Digital 64-bit technology and ADABAS D. Super-productive. Ultra-reliable.

With ADABAS D from Software AG and Very Large Memory technology from Digital, you'll not only boost your company's productivity in areas like decision support and data warehousing, you'll do it nonstop, around the clock — thanks to an exclusive marriage of clustering and data mirroring technologies. For blazing performance, superior scalability and excellent price/performance, act fast. Call **1•800•423•2227 ext.1122** or **1•800•DIGITAL, press 4**, today.

SOFTWARE AG digital™

www.sagus.com www.digital.com

RKY
©1996 Digital Equipment Corporation. Logital and the DIGITAL logo are trademarks of Digital Equipment Corporation.
Software AG is a trademark of Software AG Corporation. All other products are trademarks or registered trademarks of their respective companies.

Apple readies PDAs, PowerBooks

By Lisa Picarille

Apple Computer, Inc. hopes that forthcoming personal digital assistants (PDA) and a revamped line of PowerBooks will reverse the company's dwindling share in the portable computer market.

Apple this month is expected to release two long-awaited additions to its PowerBook family and products from its newly formed Information Appliance Division.

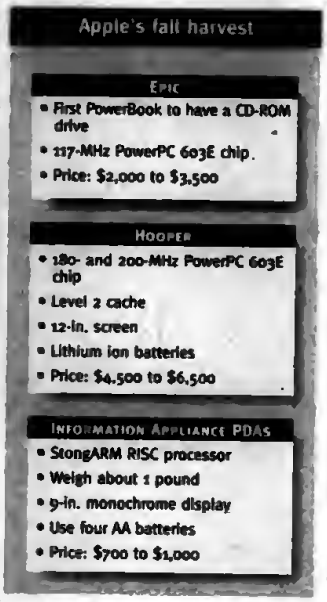
"We've been waiting too long for new PowerBooks," said Mike Bailey, a systems analyst at Lockheed Martin Missiles & Space in Sunnyvale, Calif., a division of Lockheed Martin Corp. "Apple used to be a leader in PowerBooks and portables, and now they are a follower. But if they can really deliver what they've promised with these PowerBooks and keep up with demand, then that should also help to restore faith in the company."

Apple has fallen from fourth to ninth in laptop sales, according to second-quarter figures from International Data Corp. in Framingham, Mass.

Apple's lower-end PowerBook, code-named Epic, will be the Cupertino, Calif., computer maker's first portable equipped with a CD-ROM drive. It will run on a 117-MHz PowerPC 603E chip, which is upgradable [CW, Aug. 26].

The Epic line, expected to cost $2,000 to $3,500, was originally slated to be delivered in July.

On the high end is a PowerBook line code-named Hooper. The Peripheral Component Interconnect-based laptop will also use the PowerPC 603E chip, but it will run at 180 or 200 MHz with an optional Level 2 cache and a 12-in. screen.


Apple's fall harvest
Epic
• First PowerBook to have a CD-ROM drive
• 117-MHz PowerPC 603E chip
• Price: $2,000 to $3,500
Hooper
• 180- and 200-MHz PowerPC 603E chip
• Level 2 cache
• 12-in. screen
• Lithium ion batteries
• Price: $4,500 to $6,500
Information Appliance PDAs
• StongARM RISC processor
• Weigh about 1 pound
• 9-in. monochrome display
• Use four AA batteries
• Price: $700 to $1,000

For Hooper, Apple has opted for lithium ion batteries. That kind of battery caused some of Apple's PowerBook 5300 models to overheat and catch on fire, prompting the company to recall the 5300 last fall. The Hooper line is expected to cost $4,500 to $6,500.

The laptop families will ship with either dual-scan or active-matrix color displays.

Apple also plans later this month to unleash the first wave of products from its Information Appliance Division, which was formed as part of the restructuring plan announced by Chairman and CEO Gilbert F. Amelio in May.

The new portable devices will include a World Wide Web browser and software bundles aimed at specific markets, including education, medical and mobile professionals.

MOST MID-SIZED COMPANIES HAVE AN UNUSUAL APPROACH TO DESIGNING THEIR INFORMATION SYSTEMS.

Patching together constantly evolving information technology.

Now, imagine the opposite: Having information technology specialists to build, manage and sopport your aystem. Being free to do what you do best while leaving the hassle of day-to-day IT management to others.

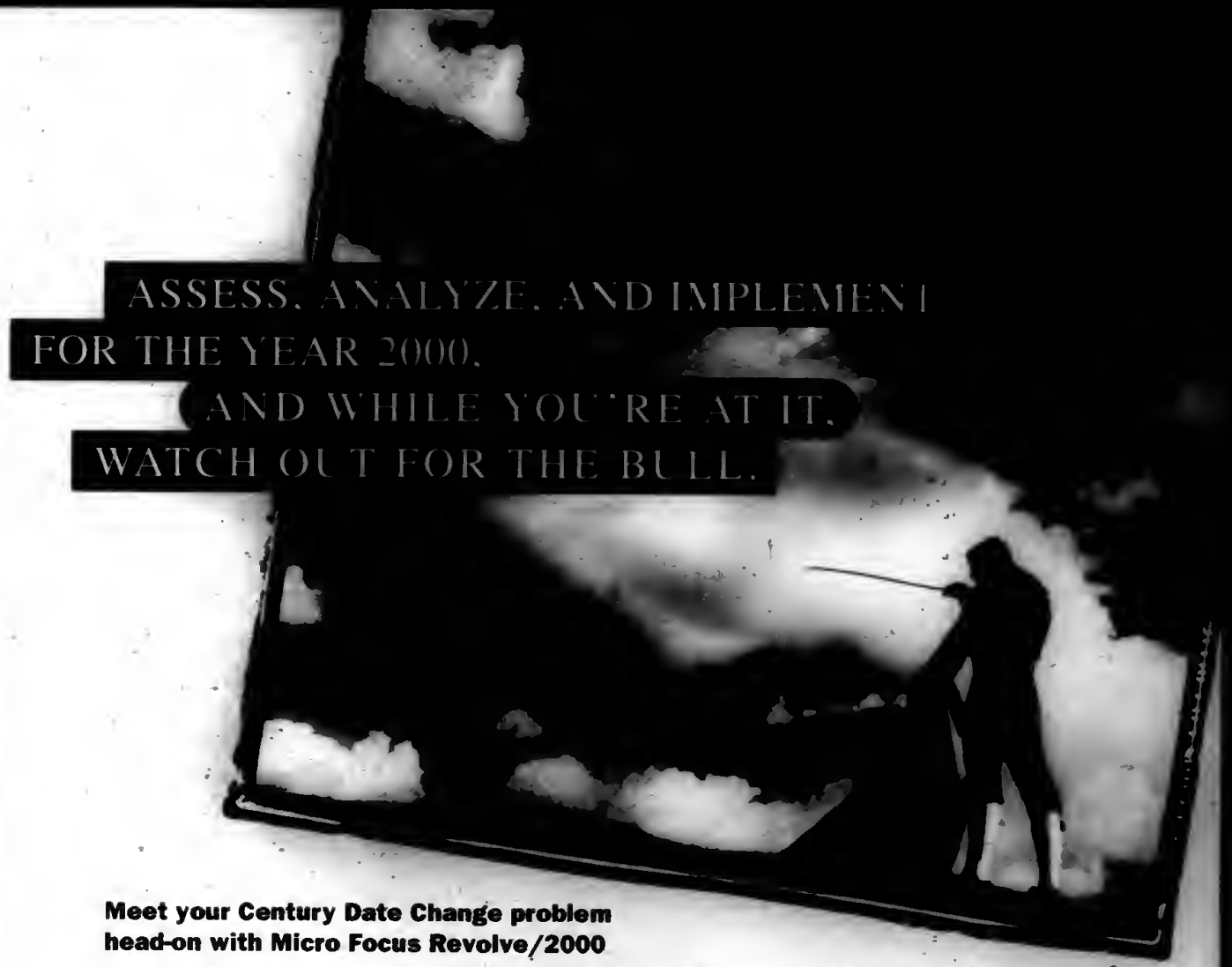
That's the point of networkMCI Enterprise Management.™ You get unlimited access to all the experience we've amassed serving the IT needs of the world's largest *Fortune 500*® companies. (We actually monitor your aystem 24 hours a day. Outsourcing that's practically insourcing.)

Our approach lets you chooae a package of services and technology to have a truly integrated, reliable information system. For more information (and there's a lot more), call your local networkMCI representative at 1-800-338-6815 or log on to http://www.mcisystemhouse.com.

MCI Systemhouse

Real benefits from converging technologies™

© 1996 MCI. All rights reserved.



Meet your Century Date Change problem head-on with Micro Focus Revolve/2000

A lot of software vendors are charging into the market with Year 2000 "solutions," but look closely—you'll find many are proprietary, incomplete, or make claims you know are too good to be true. With our experience, we know better. Micro Focus Revolve/2000, gives you tangible, comprehensive technology in a single package that lowers your risk and addresses every step in the process.

Revolve/2000 can work with other Micro Focus tools to provide seamless access to host files from the PC.

First, Revolve/2000's Assessment and Analysis facilities help you quickly identify every date occurrence in your applications and automatically locate the source code that needs modification. You'll see precisely which parts need to be changed and get an estimate of the cost and effort required to do it. That way, you'll be in a better position to decide what internal or external resources are needed to get the job done.

Next, its Implementation facilities let you either automatically convert two-digit date fields to four-digit fields or efficiently make source code modifications with its integrated editor.

Then use Revolve/2000's built-in syntax checker to find errors and help ensure clean compiles before testing, either on the mainframe or, more cost-effectively, on a PC with other Micro Focus application development tools.

Nobody else offers anything like Revolve/2000. That's because we're the 20-year leader in tools and services for developing and maintaining legacy systems. We know how to help you avoid stepping in someone else's mistakes.

See For Yourself. Call Micro Focus and order your Revolve/2000 demo disk today. You'll see why it's the only solution you need. Dial 1-800-632-6265 or visit us at http://www.microfocus.com.

Transforming Enterprise Systems **MICRO FOCUS®**

©1996 Micro Focus Ltd. Micro Focus is a registered trademark.

Using the Internet for project management

By Bob Wallace

If you had the ambitious job of wiring 1,554 far-flung sites to the Internet, what would you do? How about using the Internet itself as a project management tool.

That's what Al Ganier and company decided to do when presented with the gargantuan task of connecting 1,554 schools in 95 Tennessee counties to the Internet across Integrated Services Digital Network (ISDN) lines.

When completed in six to eight weeks, the $5.6 million ConnecTen program will provide 860,000 students and their teachers access to the Internet's vast educational resources.

The project's logistics entailed configuring routers for each school, coordinating ISDN line provision and equipment installation among 27 telephone companies and creating an information-packed World Wide Web page to keep everyone abreast of the project's status.

"We exchanged the files we needed to establish and verify routing tables for all the schools' remote access routers with Cabletron [Systems, Inc.] over the 'net," Ganier explained. He is president of Connect Tennessee Students, a nonprofit group in Nashville that runs the ConnecTen project.

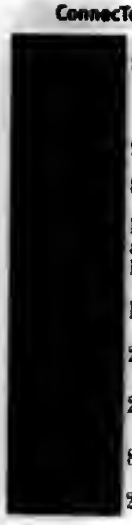
"There was almost no paper involved, which meant the process was more efficient and far less time-consuming," Ganier said.

The Web page also enabled schools to check on the Internet — rather than flood his network operating center with hundreds of telephone calls — for available IP addresses and the installation dates for every school.

Industry analysts said they were impressed with Ganier's approach to project management.

ConnecTen "is breaking new ground in project management, which is by far the toughest and most demanding aspect of any network undertaking," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J.

ConnecTen stats



$5.6 million	
1,554	
95	
860,000	
Macintosh and Novell NetWare LANs	
Navigator 2.0	
250	
2,000	
8	
27	

In control

Network managers can now set policies for how they want mobile workers and branch offices to access resources at central sites, thanks to an innovative package introduced last week by Cabletron Systems, Inc.

SecureFast VRA Manager runs on a Microsoft Corp. Windows NT server and lets administrators set up security, management, connection configuration, accounting and reporting rules across multiple Cabletron CyberSwitch central site remote access servers. The rules can keep the servers from accepting calls during specific times of the day or days of the week. Used with call accounting data, the rules can help IS managers save on wide-area network charges.

"Cabletron is the first internetworking vendor to extend the policy benefits of campus networks to the growing remote access community," said John Morency, a principal at The Registry, Inc., a Newton, Mass., consulting and research firm. "Once the remote user gets approved by VRA Manager, he or she can rock 'n' roll across the campus network."

— Bob Wallace

StorageTek users still jittery

Mainframe storage customers worry about IBM's plans

By Tim Ouellette

Data center managers attending last week's Storage Technology Corp. conference here just wanted to know who is minding the store.

Users had questions about a June agreement that gives mainframe storage competitor IBM sole responsibility for sales and marketing of StorageTek's line of mainframe disk arrays (CW, June 17).

"We had mixed feelings because everything coming from one vendor can limit competition, which has been good for us in the past with lower prices," said Dan Stanton, director of information processing services operations at MCA, Inc. in Universal City, Calif.

Attendees said they don't want prices of mainframe disk storage to go up with one fewer vendor in the mix, and they wonder about IBM's commitment to marketing the StorageTek products while still selling its own Ramac systems. Also, users don't know who will provide product support and maintenance now that there is a mix of old StorageTek shops, StorageTek shops getting upgrades from IBM and new IBM customers.

With StorageTek's removal, remaining rivals to IBM include EMC Corp. and Hitachi Data Systems Corp. Although there is one fewer player, disk array prices have declined over the past year and users expect good things from IBM enhancements to StorageTek products (see chart).

"IBM and StorageTek have both served us extremely well, and we hope it continues" with this agreement, said Tom Birk, manager of the Environmental Protection Agency's National Computer Center in Raleigh, N.C.

Melting iceberg

Now that StorageTek's Iceberg is part of IBM's Ramac line, IBM is adding its own new features, including:

- IBM 4.5G-byte disk drives
- Optional array configurations, including 8 disks for 80G bytes or 16 disks for 210G bytes
- Smaller footprint
- Integrated packaging with other IBM products

In the cards

IBM and StorageTek officials revealed the following:

- IBM will handle maintenance for new installations and upgrades to StorageTek's Iceberg disk arrays, while StorageTek will continue maintenance for existing Iceberg customers.
- If the agreement isn't renewed in 1999, customers who bought or upgraded systems from IBM will still receive support from IBM.
- IBM will continue to work on its Seastar project, its next-generation, fault-tolerant disk storage technology that isn't expected to be released until 1998. Seastar won't compete directly with Iceberg but will target higher-end users.
- There is no plan to expand the agreement to other product lines, specifically tape-storage systems.
- IBM is committed to sell a minimum number of StorageTek systems, and StorageTek has committed to certain target dates for new development on the products.

Paul O'Neil, vice president of IBM's high-end storage business, said getting the right information from IBM staff to users is IBM's highest priority.

"We've been cautious about putting too much future [Iceberg] product information in IBM [marketing's] hands right away," O'Neil said.

Louisville, Colo.-based StorageTek entered into the deal with IBM because it felt its smaller sales force could not properly market its line of disk products. Sales in the high-end disk storage market are projected to hit $6.1 billion in 1996, according to International Data Corp. in Framingham, Mass.

IBM unveils storage copy feature in Ramac Virtual Array. See page 41.

StorageTek plans management software

A tool being developed by StorageTek may soon give users a better picture of how to store their corporate data.

MetaLabel software will manage indexes of data on tape storage systems to make it easier to find data and understand where and how it's stored. Another tool being prepared, Virtual Storage Manager, simplifies the way data is organized among storage volumes in tape cartridge libraries.

The firm also plans to let its Central Archive Management (CAM) software provide backup data from LANs to Unix systems. Currently, CAM backs up only LAN data to mainframe storage. Such products may give users more options in the way they handle data coming into their central storage and backup systems.

"This reflects a trend in the market to move into storage management, not just storage of data," said Ray Freeman, president of storage consultancy Freeman Associates, Inc. in Santa Barbara, Calif.

MetaLabel builds on the concept of managing metadata. Users can get an integrated picture of the medium on which the data is stored and content, usage and relationships between data sets in their networked storage system. The information can be used to better distribute data to various types of tape storage and ensure that data can be placed in the most secure storage media based on its importance.

— Tim Ouellette

Using the Internet for project management

By Bob Wallace

If you had the ambitious job of wiring 1,554 far-flung sites to the Internet, what would you do? How about using the Internet itself as a project management tool.

That's what Al Ganier and company decided to do when presented with the gargantuan task of connecting 1,554 schools in 95 Tennessee counties to the Internet across Integrated Services Digital Network (ISDN) lines.

When completed in six to eight weeks; the $5.6 million ConnecTen program will provide 860,000 students and their teachers access to the Internet's vast educational resources.

The project's logistics entailed configuring routers for each school, coordinating ISDN line provision and equipment installation among 27 telephone companies and creating an information-packed World Wide Web page to keep everyone abreast of the project's status.

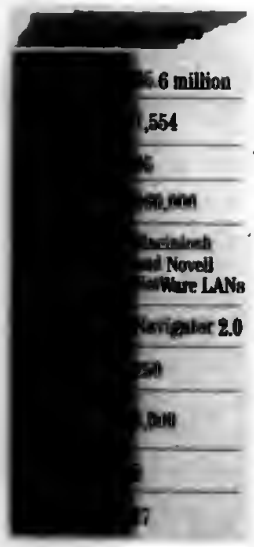
"We exchanged the files we needed to establish and verify routing tables for all the schools' remote access routers with Cabletron [Systems, Inc.] over the 'net," Ganier explained. He is president of Connect Tennessee Students, a nonprofit group in Nashville that runs the ConnecTen project.

"There was almost no paper involved, which meant the process was more efficient and far less time-consuming," Ganier said.

The Web page also enabled schools to check on the Internet — rather than flood his network operating center with hundreds of telephone calls — for available IP addresses and the installation dates for every school.

Industry analysts said they were impressed with Ganier's approach to project management.

ConnecTen "is breaking new ground in project management, which is by far the toughest and most demanding aspect of any network undertaking," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J.



In control

Network managers can now set policies for how they want mobile workers and branch offices to access resources at central sites, thanks to an innovative package introduced last week by Cabletron Systems, Inc.

SecureFast VRA Manager runs on a Microsoft Corp. Windows NT server and lets administrators set up security, management, connection configuration, accounting and reporting rules across multiple Cabletron CyberSwitch central site remote access servers. The rules can keep the servers from accepting calls during specific times of the day or days of the week. Used with call accounting data, the rules can help IS managers save on wide-area network charges.

"Cabletron is the first internetworking vendor to extend the policy benefits of campus networks to the growing remote access community," said John Morency, a principal at The Registry, Inc., a Newton, Mass., consulting and research firm. "Once the remote user gets approved by VRA Manager, he or she can rock 'n' roll across the campus network."

— Bob Wallace

StorageTek users still jittery

Mainframe storage customers worry about IBM's plans

By Tim Ouellette
ALBUQUERQUE, N.M.

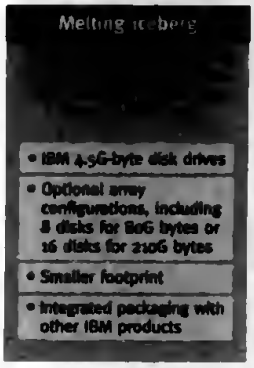
Data center managers attending last week's Storage Technology Corp. conference here just wanted to know who is minding the store.

Users had questions about a June agreement that gives mainframe storage competitor IBM sole responsibility for sales and marketing of StorageTek's line of mainframe disk arrays [CW, June 17].

"We had mixed feelings because everything coming from one vendor can limit competition, which has been good for us in the past with lower prices," said Dan Stanton, director of information processing services operations at MCA, Inc. in Universal City, Calif.

Attendees said they don't want prices of mainframe disk storage to go up with one fewer vendor in the mix, and they wonder about IBM's commitment to marketing the StorageTek products while still selling its own Ramac systems. Also, users don't know who will provide product support and maintenance now that there is a mix of old StorageTek shops, StorageTek shops getting upgrades from IBM and new IBM customers.

With StorageTek's removal, remaining rivals to IBM include EMC Corp. and Hitachi Data Systems Corp. Although there is one fewer player, disk array prices have declined over the past year and users expect good things from IBM enhancements to StorageTek products (see chart).


Melting iceberg
• IBM 4.5G-byte disk drives
• Optional array configurations, including 8 disks for 80G bytes or 16 disks for 210G bytes
• Smaller footprint
• Integrated packaging with other IBM products

"IBM and StorageTek have both served us extremely well, and we hope it continues" with this agreement, said Tom Birk, manager of the Environmental Protection Agency's National Computer Center in Raleigh, N.C.

In the cards

IBM and StorageTek officials revealed the following:

- IBM will handle maintenance for new installations and upgrades to StorageTek's Iceberg disk arrays, while StorageTek will continue maintenance for existing Iceberg customers.
- If the agreement isn't renewed in 1999, customers who bought or upgraded systems from IBM will still receive support from IBM.
- IBM will continue to work on its Seastar project, its next-generation, fault-tolerant disk storage technology that isn't expected to be released until 1998. Seastar won't compete directly with Iceberg but will target higher-end users.
- There is no plan to expand the agreement to other product lines, specifically tape-storage systems.
- IBM is committed to sell a minimum number of StorageTek systems, and StorageTek has committed to certain target dates for new development on the products.

Paul O'Neil, vice president of IBM's high-end storage business, said getting the right information from IBM staff to users is IBM's highest priority.

"We've been cautious about putting too much future [Iceberg] product information in IBM [marketing's] hands right away," O'Neil said.

Louisville, Colo.-based StorageTek entered into the deal with IBM because it felt its smaller sales force could not properly market its line of disk products. Sales in the high-end disk storage market are projected to hit $6.1 billion in 1996, according to International Data Corp. in Framingham, Mass.

IBM unveils storage copy feature in Ramac Virtual Array. See page 41.

StorageTek plans management software

A tool being developed by StorageTek may soon give users a better picture of how to store their corporate data.

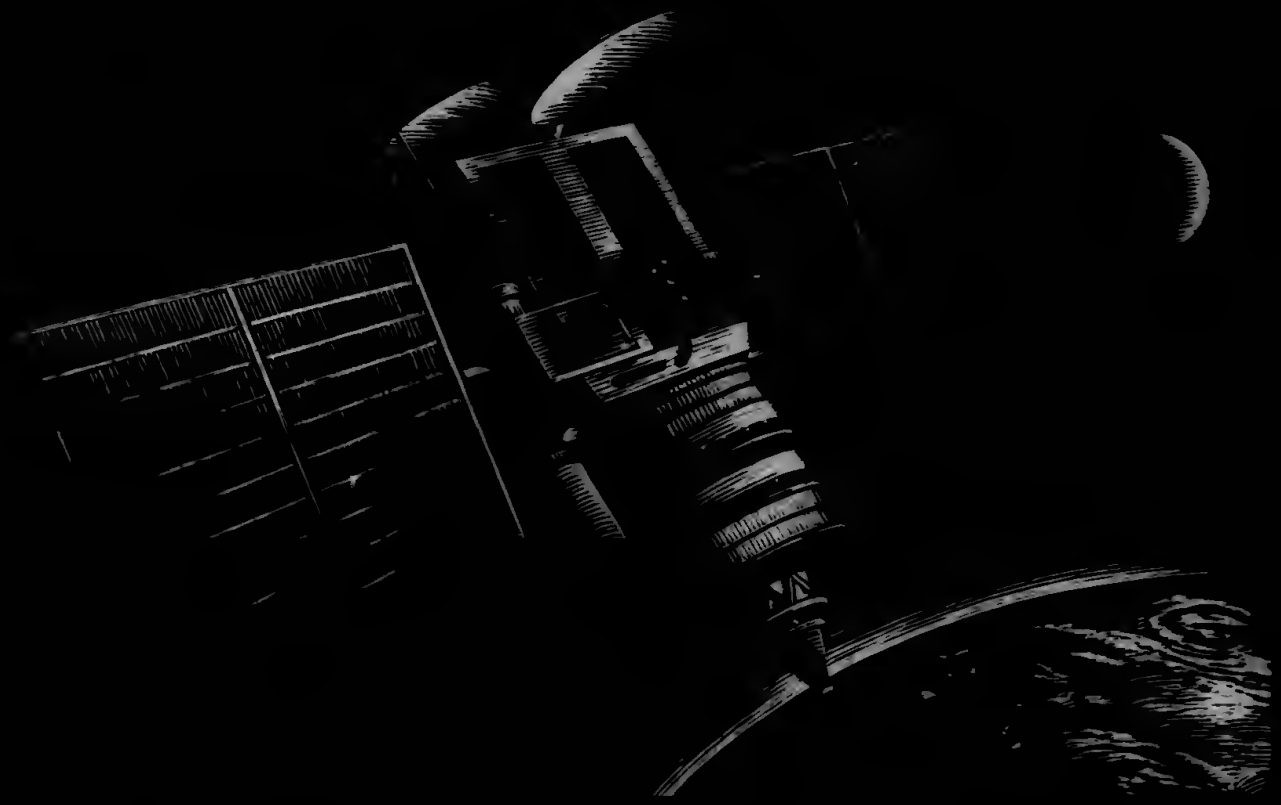
MetaLabel software will manage indexes of data on tape storage systems to make it easier to find data and understand where and how it's stored. Another tool being prepared, Virtual Storage Manager, simplifies the way data is organized among storage volumes in tape cartridge libraries.

The firm also plans to let its Central Archive Management (CAM) software provide backup data from LANs to Unix systems. Currently, CAM backs up only LAN data to mainframe storage. Such products may give users more options in the way they handle data coming into their central storage and backup systems.

"This reflects a trend in the market to move into storage management, not just storage of data," said Ray Freeman, president of storage consultancy Freeman Associates, Inc. in Santa Barbara, Calif.

MetaLabel builds on the concept of managing metadata. Users can get an integrated picture of the medium on which the data is stored and content, usage and relationships between data sets in their networked storage system. The information can be used to better distribute data to various types of tape storage and ensure that data can be placed in the most secure storage media based on its importance.

— Tim Ouellette



Netscape Plug-ins and Web Server Objects. Get ready to launch dynamic business applications out on the World Wide Web with PowerBuilder 5.0.

Now you can use market-leading PowerBuilder® 5.0, together with Powersoft's new web.pb™ to build real-world applications that run on any Web server, access corporate data with our patented DataWindow™ technology, and generate HTML on the fly for your favorite Web browser.

Visit us at www.powersoft.com and you may win free products or other great prizes.

What's more, PowerBuilder 5.0 lets you create applications that run as Netscape Plug-ins for any Plug-in compatible browser. And since PowerBuilder 5.0 supports ActiveX controls, you can extend your applications' reach even further with new Internet components.

So "Web-ize" your applications today with PowerBuilder 5.0. It's available in three editions: Desktop, Professional, and Enterprise. To explore it at one of our seminars or to get more information, call us at 1-800-395-3525. And get ready to send your PowerBuilder applications into orbit.

Powersoft

ActiveX gets a boost

Windows 3.1, Unix versions of Explorer to support technology

By Frank Hayes

Continuing its push to make ActiveX an Internet standard, Microsoft Corp. last week said it will support the component technology in the Windows 3.1 and Unix versions of Internet Explorer, its World Wide Web browser.

Internet standards

Microsoft Chairman and CEO Bill Gates demonstrated an early version of Internet Explorer 3.0 for Unix at last week's Uaix Expo Plus trade show in New York.

The company also announced that upgraded versions for Windows 3.1, Unix and Macintosh that support ActiveX will be available free by year's end.

"We like what we see of ActiveX, and the fact that it's on platforms other than Windows 95 will give us more flexibility," said Wayne Lemmerhirt, manager of technology services at Boston Edison Co., where the standard desktop runs Windows 3.1.

ActiveX, Microsoft's software-component technology, is built in to Windows 3.1, Windows 95 and Windows NT.

Earlier this month, Microsoft announced it had formed a consortium of software vendors called The Active Group to license ActiveX for other platforms, such as Unix. ActiveX is a revamped version of Microsoft's OLE 2.0 technology, which is included in Windows 3.1.

Java alternative

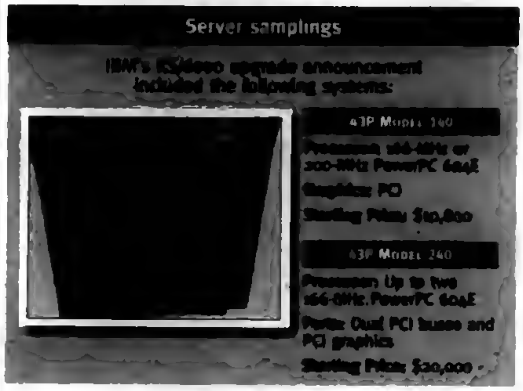
Microsoft also has put forward ActiveX as a way to embed small programs into Web pages. ActiveX components would be an alternative to Java applets, the small programs written in Sun Microsystems, Inc.'s cross-platform Internet language.

Currently, neither ActiveX nor Java is supported in Web browsers that run oa Windows 3.1, which is still widely used on business desktops.

"There are certainly more Windows 3.1 clients than there are Apple [Computer, Inc.] or Sun [clients] combined," said Paul Mahowald, vice president of information systems at Blockbuster Entertainment, a division of Viacom International, Inc. in Fort Lauderdale, Fla. "Having Java applets available on Windows 3.1 will be very useful."

IBM and Netscape Communications Corp. are developing Java support for Windows 3.1. Netscape plans to release a Java-enabled version of its Navigator 3.0 browser for Windows 3.1 this month.

Neither ActiveX aor Java ia supported in the beta versioo of Internet Explorer 3.0 for Windows 3.1 that Microsoft made available at its Web site this week. Those features will be added before the product ships at year's end, company officials said. Still, as corporate developers begin to build client/server applications that use Web browsers and run across corporate intranets, users like having a second option for a full-featured browser, observers said.



IBM plays catch-up in Unix server space

Biggest overhaul in six years will add price and performance improvements

By Jaikumar Vijayan

IBM last week introduced new systems, processors, clustering capabilities and broader Internet support in a wide-ranging refresh of its RS/6000 line of Unix workstations and servers.

The announcements include aew PowerPC 604E-based workstations and servers; a dual-processor technical workstation that costs less than $20,000; more World Wide Web software options; and a disaster-recovery capability for long-distance remote backup.

This marks the biggest overhaul of the popular lineup since it was launcbed six years ago. It brings IBM users some long-awaited technology and performance enhancements.

The lineup gives users "a broader system range with new processors at the low end and the high end and significantly better performance at the same price points," said Peter Lowber, an analyst at Datapro Informatioo Services Group in Delran, N.J.

Catching up

The announcements also help IBM close a dangerously widening price and performance gap between its RS/6000 systems and those from vendors such as Hewlett-Packard Co., Sun Microsystems, Inc. and Silicon Graphics, Inc., analysts said.

"They are finally getting out what they said they were going to for the past year. They are just playing catch-up," said Roy Dodd, MIS director at The Good Guys, Inc., an electronics retailer in Brisbane, Calif.

But "this definitely gets IBM back in the mainstream and puts them in a good position with systems from vendors like HP and SGI," said Thomas Copeland, an analyst at International Data Corp. in Framingham, Mass.

New agenda

The highlights of IBM's announcement included the following:

- The introduction of 166- and 200-MHz PowerPC 604E uni- and dual-processor workstations and servers.
- Peripheral Component Interconnect-based graphics support. That means users will have a much larger choice of graphics components compared with IBM's proprietary Micro Channel Architecture-based graphics environment.
- A supercomputer and a desk-side system based on IBM's high-end Power2 Super Chip.
- Electronic commerce software, Lotus Notes 4.5 and Java-based software options with IBM's Powersoft integrated Internet bundle.
- A high-storage capacity symmetrical multiprocessing server that supports up to 81.9G bytes of internal RAID storage, up to 1G byte of memory and up to 22 bays and nine expansion slots.

Sun brings clustering to its server line. See page 41.

Users still bugged by Explorer 3.0

By Kim S. Nash

Microsoft Corp. last week released a beta-test edition of Internet Explorer 3.0 for Windows 3.1, but some users wonder whether it will have the same problems found in the Windows 95 version of the browser that shipped in August.

Some problems have been fixed, but several users are vexed by the bugs that remain.

Internet Explorer 3.0 scored high marks over rival Netscape Navigator 3.0 for look and feel and some advanced capabilities. But the product has been far from trouble-free, users said.

Several past problems

Oo its World Wide Web site, Microsoft lists 12 "known issues" with Internet Explorer 3.0 (see chart), but users said they have discovered many more.

For example, errors related to the Wininet runtime library frequently crop up, including systems crashes and the inability to get Internet Explorer running after such a crash, according to complaints on Microsoft and Usenet newsgroups.

Internet Explorer support engineers who monitor the newsgroups said they know about the error but haven't devised a fix.

Some users feared that Microsoft — in its race to compete with Netscape Communications Corp. — simply rushed Internet Explorer 3.0 out before its time.

"Microsoft was oot ready for the program to ship when it did," said Kevin Thomas, presideot of MetroPage, a pager and cellular telephone company in Atlanta. "I am not completely satisfied."

Other users agreed. One user, who asked to remain anonymous, said he suffers regular, unexplained "total system lockups" that force him to reboot his PC. "This is very serious," he said.

Microsoft didn't return calls last week requesting commenta about the remaining bugs. The company did fix some bugs in Internet Explorer 3.0 for Windows 95 just after the browser shipped.

The fix

Problem	Solution
Internet Explorer 3.0 won't run when Trumpet WinSock Point-to-Point Protocol is installed	Microsoft is researching the problem; it is telling users to remove Trumpet WinSock
Screen flashes or flickers	Change code in registry, then reinstall browser
Some browser plug-ins won't work	Some add-ons require that Navigator also be installed. Microsoft is working with plug in makers to tweak their products for Explorer or build similar ActiveX components

Users to Netscape: Keep your promises

By Kim S. Nash

Netscape will offer a ton of product promises and road maps — maybe even a bridge to the 21st century — at its user conference this week in New York. But users will ask the World Wide Web software vendor when it will fulfill some of its previous campaign promises.

At the top of the list is when Netscape Communications Corp. will integrate the groupware products it garnered in a $108 million buyout of Collabra Software, Inc. 13 months ago.

At the time, Netscape said that by the middle of this year its Navigator browser would let users access shared Collabra files. But support for Collabra has been delayed until Navigator 4.0 ships, which is expected in early 1997.

"We now have to wait for Netscape to drive the direction of a product that we were all set to take off with," said Geoffrey Teekema, a project manager at Boston Scientific Corp.

The Natick, Mass.-based medical instruments maker bought a 2,000-user license from Collabra before Netscape acquired the company.

Some of the delay in Collabra support stems from Netscape's ripping out Collabra's proprietary groupware technology to replace it with a work-sharing system based on the Net News Transport Protocol (NNTP) standard. NNTP is used in Usenet newsgroups, for example.

But Netscape will give showgoers a peek at Navigator 4.0, including a look at its Tools menu, which will contain Collabra-related commands [CW, Oct. 7].

On the way

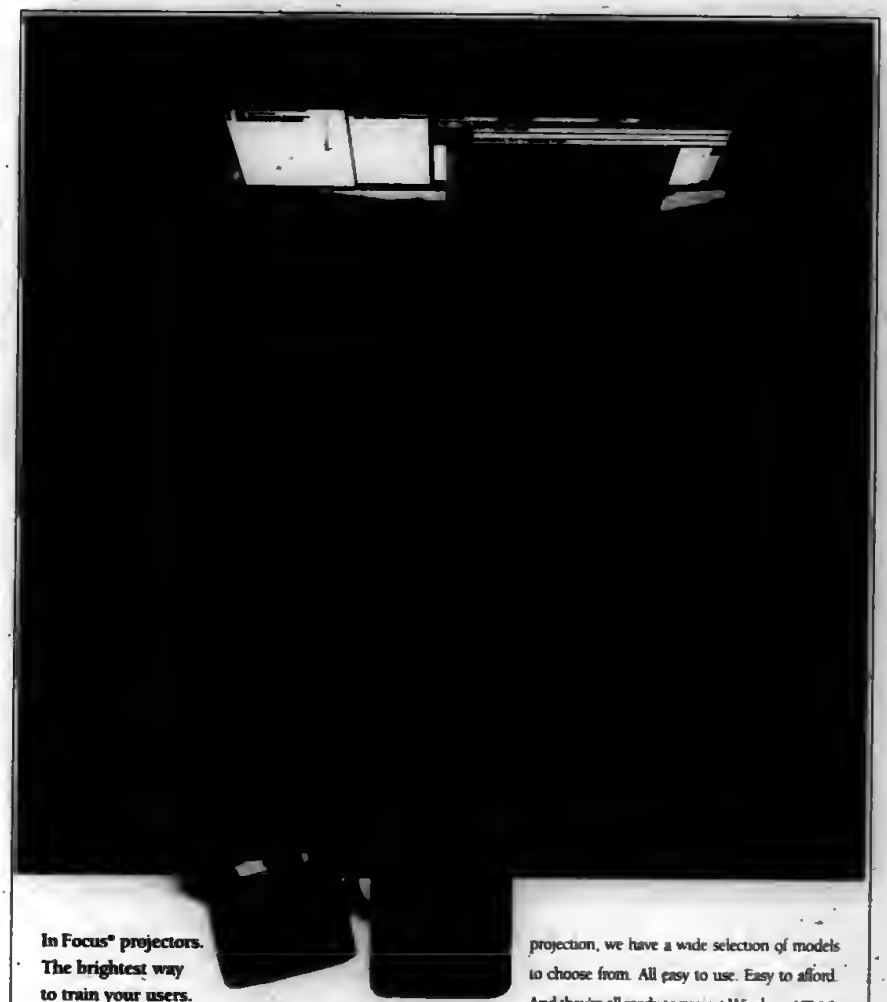
Also on tap for the conference are the following:

- How-to sessions on using Lightweight Directory Access Protocol services to track intranet users' rights and permissions.
- Previews of upgrades to the SuiteSpot line of Web servers, which are due in the first half of next year.
- Previews of legacy access utilities that will link intranets to existing systems and back-end databases.

Some users are grumbling about Netscape's snub of Microsoft Corp.'s ActiveX Internet development technology. Microsoft agreed to support Sun Microsystems, Inc.'s rival Java programming language, but Netscape officials have said they have no similar plans for ActiveX.

That may cause trouble for application developers at large user sites who want to run both Netscape and Microsoft browsers, said an information systems manager at a large retailer, who requested anonymity. "Netscape is going to have to embrace ActiveX and not rely on a third-party, half-baked plug-in," the manager said.

Canadian firm uses Internet to speed stock market research. See page 73.



In Focus® projectors. The brightest way to train your users.

Windows NT® 4.0 is finally here. And that's great news, except that no one knows how to use it. We can help.

Start with an In Focus projector. It takes what's on your computer screen and projects it to an entire room full of people. So you can teach everyone in your office how to run a computer again—all at the same time.

And since we're the world leader in multimedia projection, we have a wide selection of models to choose from. All easy to use. Easy to afford. And they're all ready to project Windows NT 4.0.

Call us, and we'll have one on your desk tomorrow with our Instant Access Rental Program. It'll help keep all that Windows NT training from driving you nuts.

InFocus SYSTEMS

Project now: 3-day rental for the price of 1
1•800•294•6400 or www.infocus.com/cw

Phone (503) 685-8888 Fax (503) 685-8887 In Europe: Phone (31) 23 5621500 Fax (31) 23 5564580 CW ©1996 In Focus Systems, Inc. In Focus is a registered trademark of In Focus Systems, Inc. All other products are trademarks of their holders

ActiveX gets a boost

Windows 3.1, Unix versions of Explorer to support technology

By Frank Hayes

Continuing its push to make ActiveX an Internet standard, Microsoft Corp. last week said it will support the component technology in the Windows 3.1 and Unix versions of Internet Explorer, its World Wide Web browser.

Internet standards

Microsoft Chairman and CEO Bill Gates demonstrated an early version of Internet Explorer 3.0 for Unix at last week's Unix Expo Plus trade show in New York.

The company also announced that upgraded versions for Windows 3.1, Unix and Macintosh that support ActiveX will be available free by year's end.

"We like what we see of ActiveX, and the fact that it's on platforms other than Windows 95 will give us more flexibility," said Wayne Lemmerhirt, manager of technology services at Boston Edison Co., where the standard desktop runs Windows 3.1.

ActiveX, Microsoft's software-component technology, is built in to Windows 3.1, Windows 95 and Windows NT.

Earlier this month, Microsoft announced it had formed a consortium of software vendors called The Active Group to license ActiveX for other platforms, such as Unix. ActiveX is a revamped version of Microsoft's OLE 2.0 technology, which is included in Windows 3.1.

Java alternative

Microsoft also has put forward ActiveX as a way to embed small programs into Web pages. ActiveX components would be an alternative to Java applets, the small programs written in Sun Microsystems, Inc.'s cross-platform Internet language.

Currently, neither ActiveX nor Java is supported in Web browsers that run on Windows 3.1, which is still widely used on business desktops.

"There are certainly more Windows 3.1 clients than there are Apple [Computer, Inc.] or Sun [clients] combined," said Paul Mahowald, vice president of information systems at Blockbuster Entertainment, a division of Viacom International, Inc. in Fort Lauderdale, Fla. "Having Java applets available on Windows 3.1 will be very useful."

IBM and Netscape Communications Corp. are developing Java support for Windows 3.1. Netscape plans to release a Java-enabled version of its Navigator 3.0 browser for Windows 3.1 this month.

Neither ActiveX nor Java is supported in the beta version of Internet Explorer 3.0 for Windows 3.1 that Microsoft made available at its Web site this week. Those features will be added before the product ships at year's end, company officials said. Still, as corporate developers begin to build client/server applications that use Web browsers and run across corporate intranets, users like having a second option for a full-featured browser, observers said.

Users still bugged by Explorer 3.0

By Kim S. Nash

Microsoft Corp. last week released a beta-test edition of Internet Explorer 3.0 for Windows 3.1, but some users wonder whether it will have the same problems found in the Windows 95 version of the browser that shipped in August.

Some problems have been fixed, but several users are vexed by the bugs that remain.

Internet Explorer 3.0 scored high marks over rival Netscape Navigator 3.0 for look and feel and some advanced capabilities. But the product has been far from trouble-free, users said.

Several past problems

On its World Wide Web site, Microsoft lists 12 "known issues" with Internet Explorer 3.0 (see chart), but users said they have discovered many more.

For example, errors related to the Wininet runtime library frequently crop up, including systems crashes and the inability to get Internet Explorer running after such a crash, according to complaints on Microsoft and Usenet newsgroups.

Internet Explorer support engineers who monitor the newsgroups said they know about the error but haven't devised a fix.

Some users feared that Microsoft — in its race to compete with Netscape Communications Corp. — simply rushed Internet Explorer 3.0 out before its time.

"Microsoft was not ready for the program to ship when it did," said Kevin Thomas, president of MetroPage, a pager and cellular telephone company in Atlanta. "I am not completely satisfied."

Other users agreed. One user, who asked to remain anonymous, said he suffers regular, unexplained "total system lockups", that force him to reboot his PC. "This is very serious," he said.

Microsoft didn't return calls last week requesting comments about the remaining bugs. The company did fix some bugs in Internet Explorer 3.0 for Windows 95 just after the browser shipped.

The fix

Microsoft's Web site (www.microsoft.com/iesupport/content/issues/) lists Internet Explorer bugs and resolutions. They include the following:

Problem	Solution
Internet Explorer 3.0 won't run when Trumpet WinSock Point-to-Point Protocol is installed	Microsoft is researching the problem; it is telling users to remove Trumpet WinSock
Screen flashes or flickers	Change code in registry, then reinstall browser
Some browser plug-ins won't work	Some add-ons require that Navigator also be installed; Microsoft is working with plug-in makers to tweak their products for Explorer or build similar ActiveX components

Server samplings

IBM's RS/6000 upgrade announcement included the following systems:

43P Model 140

Processor: 166-MHz or 200-MHz PowerPC 604E

Graphics: PCI

Starting Price: $10,800

43P Model 240

Processor: Up to two 166-MHz PowerPC 604E

Ports: Dual PCI buses and PCI graphics

Starting Price: $20,000

IBM plays catch-up in Unix server space

Biggest overhaul in six years will add price and performance improvements

By Jaikumar Vijayan

IBM last week introduced new systems, processors, clustering capabilities and broader Internet support to a wide-ranging refresh of its RS/6000 line of Unix workstations and servers.

The announcements include new PowerPC 604E-based workstations and servers; a dual-processor technical workstation that costs less than $20,000; more World Wide Web software options; and a disaster-recovery capability for long-distance remote backup.

This marks the biggest overhaul of the popular lineup since it was launched six years ago. It brings IBM users some long-awaited technology and performance enhancements.

The lineup gives users "a broader system range with new processors at the low end and the high end and significantly better performance at the same price points," said Peter Lowber, an analyst at Datapro Information Services Group in Delran, N.J.

Catching up

The announcements also help IBM close a dangerously widening price and performance gap between its RS/6000 systems and those from vendors such as Hewlett-Packard Co., Sun Microsystems, Inc. and Silicon Graphics, Inc., analysts said.

"They are finally getting out what they said they were going to for the past year. They are just playing catch-up," said Roy Dodd, MIS director at The Good Guys, Inc., an electronics retailer, in Brisbane, Calif.

But "this definitely gets IBM back in the mainstream and puts them in a good position with systems from vendors like HP and SGI," said Thomas Copeland, an analyst at International Data Corp. in Framingham, Mass.

New agenda

The highlights of IBM's announcement included the following.

- The introduction of 166- and 200-MHz PowerPC 604E uni- and dual-processor workstations and servers.
- Peripheral Component Interconnect-based graphics support. That means users will have a much larger choice of graphics components compared with IBM's proprietary Micro Channel Architecture-based graphics environment.
- A supercomputer and a desk-side system based on IBM's high-end Power2 Super Chip.
- Electronic commerce software, Lotus Notes 4.5 and Java-based software options with IBM's Powersoft integrated Internet bundle.
- A high-storage capacity symmetrical multiprocessing server that supports up to 81.9G byte's of internal RAID storage, up to 1G byte of memory and up to 22 bays and nine expansion slots.

Sun brings clustering to its server line. See page 41.

Users to Netscape: Keep your promises

By Kim S. Nash

Netscape will offer a ton of product promises and road maps — maybe even a bridge to the 21st century — at its user conference this week in New York. But users will ask the World Wide Web software vendor when it will fulfill some of its previous campaign promises.

At the top of the list is when Netscape Communications Corp. will integrate the groupware products it garnered in a $108 million buyout of Collabra Software, Inc. 13 months ago.

Getting beyond Oracle

At the user conference this week, Netscape is expected to answer questions about porting its electronic commerce Web servers — Publishing, Merchant and Community — to databases other than Oracle's. Informix versions were slated to ship this quarter or early next quarter but might be pushed back to early next year.

At the time, Netscape said that by the middle of this year its Navigator browser would let users access shared Collabra files. But support for Collabra has been delayed until Navigator 4.0 ships, which is expected in early 1997.

"We now have to wait for Netscape to drive the direction of a product that we were all set to take off with," said Geoffrey Teekema, a project manager at Boston Scientific Corp.

The Natick, Mass.-based medical instruments maker bought a 2,000-user license from Collabra before Netscape acquired the company.

Some of the delay in Collabra support stems from Netscape's ripping out Collabra's proprietary groupware technology to replace it with a work-sharing system based on the Net News Transport Protocol (NNTP) standard. NNTP is used in Usenet newsgroups, for example.

But Netscape will give showgoers a peek at Navigator 4.0, including a look at its Tools menu, which will contain Collabra-related commands (CW, Oct. 7).

On the way

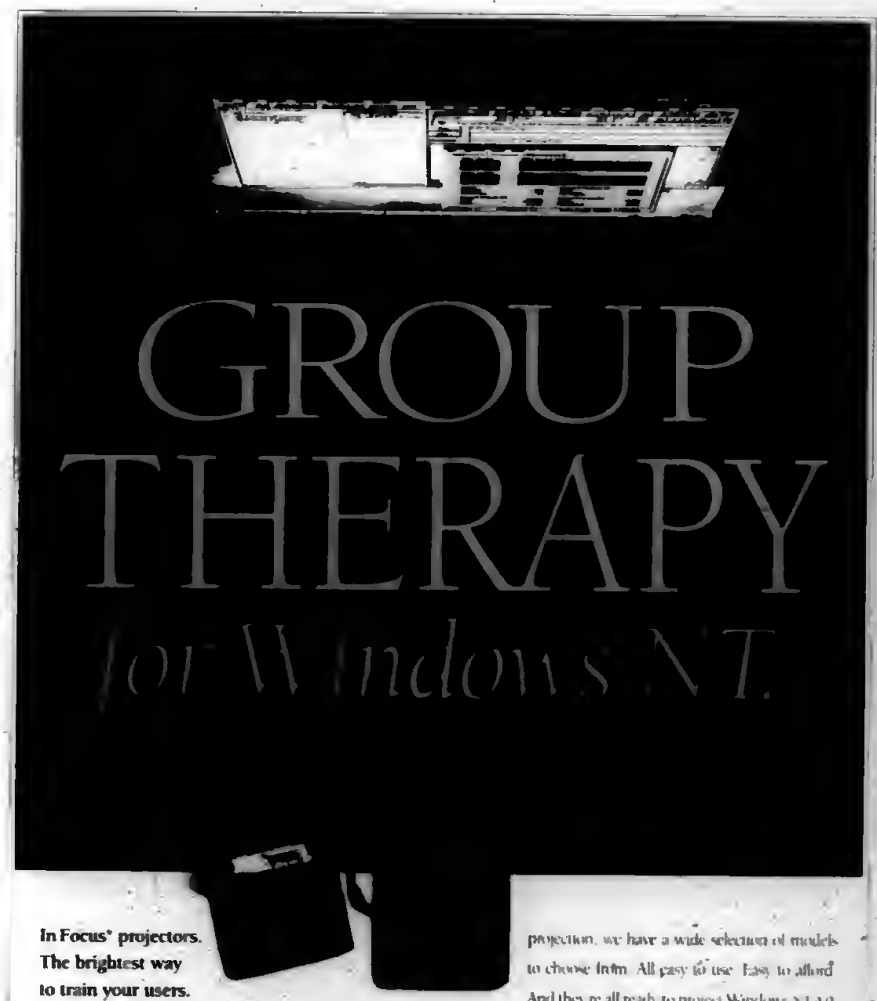
Also on tap for the conference are the following:

- How-to sessions on using Lightweight Directory Access Protocol services to track intranet users' rights and permissions.
- Previews of upgrades to the SuiteSpot line of Web servers, which are due in the first half of next year.
- Previews of legacy access utilities that will link intranets to existing systems and back-end databases.

Some users are grumbling about Netscape's snub of Microsoft Corp.'s ActiveX Internet development technology. Microsoft agreed to support Sun Microsystems, Inc.'s rival Java programming language, but Netscape officials have said they have no similar plans for ActiveX.

That may cause trouble for application developers at large user sites who want to run both Netscape and Microsoft browsers, said an information systems manager at a large retailer, who requested anonymity. "Netscape is going to have to embrace ActiveX and not rely on a third-party, half-baked plug-in," the manager said.

Canadian firm uses Internet to speed stock market research. See page 73.



In Focus® projectors. The brightest way to train your users.

Windows NT® 4.0 is finally here. And that's great news, except that no one knows how to use it. We can help.

Start with an In Focus projector. It takes what's on your computer screen and projects it to an entire room full of people. So you can teach everyone in your office how to run a computer again—all at the same time.

And since we're the world leader in multimedia projection, we have a wide selection of models to choose from. All easy to use. Easy to afford. And they're all ready to project Windows NT 4.0.

Call us, and we'll have one on your desk tomorrow with our Instant Access Rental Program. It'll help keep all that Windows NT training from driving you nuts.

InFocus® SYSTEMS

Project now: 3-day rental for the price of 1
1-800-294-6400 or www.infocus.com/cw

Computer Industry

CA captures Cheyenne

Seeks lead in workgroup management

By Patrick Dryden and Matt Hamblen

In a bold bid to broaden its systems management reach into LANs, Computer Associates International, Inc. last week acquired Cheyenne Software, Inc. for roughly $1.2 billion.

CA seeks to extend its Unicenter systems management support further into workgroups by integrating Cheyenne's popular LAN backup and virus protection tools and taking over its sales channels.

At stake is a market for enterprise systems management software that is projected to reach $7 billion to $10 billion by 1999. Also vying for a slice of that pie are vendors such as Tivoli Systems, Inc. and Hewlett-Packard Co. with their integrated platforms.

Industry analysts generally praised the move, but some users said they were worried about the outcome.

"CA's management suite will look more attractive with these products closely tied to the line, but I'm concerned about their bad reputation for support," said Byron Jones, systems administrator at the University of Miami in Coral Gables, Fla. "They tend to buy companies for technology but then leave the products to die on the vine." Jones uses software from both vendors.

But CA pledged to break from tradition and keep all 800 Cheyenne employees in a division that will continue to support its distribution channel and users.

"This time they have a good fit because the product lines don't overlap," said Brian Burba, management analyst at international Data Corp. in Framingham, Mass. "CA lacks [Novell, Inc.] NetWare storage management support and expects to grow support for Windows NT better than Cheyenne can."

Merging management

- Data management tools for workgroups, including ARCServe backup and InnocuLAN virus scanning software
- Staff of 800 with expertise in workgroup-level software, support and sales
- Distribution channel to complement CA's direct sales force
- Partnerships for developing and spreading Unicenter tools

This way CA can grab a leadership position in workgroup storage management, taking a shortcut from the long and costly development road to support LANs and desktops, said Sue Aldrich, an analyst at Patricia Seybold Group in Boston.

CA plans to integrate ARCServe software for backup and hierarchical storage management, along with the InnocuLAN virus scanner, into its Unicenter line, said Charles Wang, chairman and CEO of CA in Islandia, N.Y.

For users, that means Cheyenne tools will gain an enterprise-wide view, said ReiJane Huai, chairman and CEO of Cheyenne in Roslyn Heights, N.Y.

Tough sell

But one potential user of CA's Unicenter systems management platform remains unswayed by the acquisition's promised benefits.

"CA is focused on pushing the Unicenter next-generation version that integrates all aspects of systems and application management. But our consultants warn us that won't ship for another year," said a bank official, who requested anonymity. "We just told them to call again when they have a real product to show us."

Lotus CEO steps down

By Tim Ouellette

Lotus Development Corp. is losing another executive, but he isn't going very far.

CEO Michael Zisman is stepping down from his post for family reasons. But Zisman will remain as vice president of strategy at the Cambridge, Mass., subsidiary of IBM.

Michael Zisman

Chief Operating Officer Jeffrey Papows will take over as CEO.

Papows had shared the office of the president with Zisman, and both reported to John M. Thompson, senior vice president of IBM's Software Group. Because Zisman and Papows had complementary roles, observers don't expect much change in Lotus' strategy.

Lotus has suffered a slew of executive resignations since it was bought by IBM in June 1995. Zisman stepped in as CEO when former CEO Jim Manzi left last October.

Jeffrey Papows

Zisman had taken a smaller part in the operations of the company since PC Expo this summer, when he had to forgo a presentation on Lotus' Domino technology due to a death in the family.

Zisman is a founder of SoftSwitch, Inc. in Wayne, Pa., which was bought by Lotus.

He is credited by observers with providing a strong technical vision for Lotus as it moved to improve its flagship Notes groupware.

"As a visionary for technology, he is probably one of the strongest people I have ever met," said Gary Rowe, principal at Rapport Communications, Inc. in Atlanta. "Lotus will miss him in that CEO slot."

Papows previously was president and CEO of Cognos Corp.

Internet providers sued for software piracy

By Stewart Deck

The Software Publishers Association (SPA) filed lawsuits late last week that charge two Internet service providers and a World Wide Web-hosting service with software piracy.

Sandra Sellers, vice president of intellectual property at the SPA, said the association filed copyright infringement lawsuits against service providers Community ConneXion, Inc. in Oakland, Calif., and GeoCities, Inc. in Beverly Hills, Calif. Tripod, Inc., a Web-hosting service in Williamstown, Mass., also was served with legal papers last Thursday.

Legal issues

The SPA filed the suits on behalf of software manufacturers Adobe Systems, Inc., Claris Corp. and Traveling Software, Inc.

Four charges

The lawsuits allege that each of the three service providers allowed their users to infringe on software copyrights in one of four ways: by posting unauthorized copies of copyrighted software, publishing illegal software authorizing serial numbers, publishing cracker/hacker utilities or letting users maintain links to file transfer protocol sites that host pirated software.

Sellers said the SPA sent each service provider a warning letter. Representatives at two of the companies said it wasn't clear whether those letters had been received.

Douglas Barnes, vice president of sales and marketing at Community ConneXion, was incensed by the association's heavy-handed tactics. "This is a groundless and frivolous lawsuit," he said. "They sent us an [electronic-mail] form letter Sept. 25, and a week later they served us with a lawsuit."

Barnes said monitoring ever-changing Web pages for content is difficult. Instead of taking legal action, the association should work with service providers on copyright policing, he said.

Ironically, Community ConneXion makes 95% of its revenue from sales of Web server and other software, Barnes said. "We were going to join the SPA before this happened. Now there's no way we will," he said.

A spokesperson at Tripod said the company is "looking into the suit." GeoCities officials declined to comment.

Chris Stevens, an Internet analyst at Aberdeen Group, Inc. in Boston, agreed with Barnes. "They need to go after the people who post pirated software, not the host. That's like suing the phone company for receiving obscene phone calls," he said.

Clinton pledges Internet funds

By Gary H. Anthes

WASHINGTON

President Clinton last week pledged $100 million of federal money to kick off a five-year program to build "the next-generation Internet."

Clinton said the funds, which would come from existing government research programs, would be used in 1998 to connect at least 100 universities and federal laboratories at speeds 100 to 1,000 times faster than today's Internet.

An additional $400 million would be used over the five years to promote experimentation with new networking technologies and demonstrate new applications in areas such as national defense, medicine, education and manufacturing. Clinton didn't say where those funds would come from.

"The results of this work will almost surely trigger serendipitous discoveries and unlock billions of dollars in corporate product/service development," said Vinton Cerf, vice president of data architecture at MCI Communications Corp. in Washington.

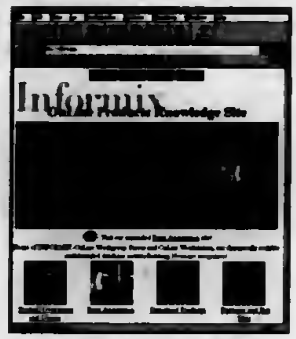
As co-developer of the Arpanet, the forerunner of the Internet, Cerf saw federal seed money in the 1970s and 1980s spawn much of today's network technology.

We have a revolutionary workgroup server up our sleeve.

INFORMIX-OnLine Workgroup Server™. The Simply Powerful, Web-ready Database for NT Workgroups.

Informix introduces the power of its OnLine Dynamic Server™ in a new, easy to use, out-of-the-CD sleeve version, created specifically for your workgroup needs.

It's the database revolution you've been hoping for. A powerful, proven RDBMS that's easy to install, easy to configure, easy to use, easy to manage, and easy to administer. Not to mention, at $295 per user, easy to afford.



With a Web Knowledge System interface and full Windows NT compatibility, it's the easiest workgroup database you can buy

It also comes with a bundle of revolutionary advantages you wouldn't expect. Like the Netscape® FastTrack™ server and Navigator™ browser software. Full Windows NT® 4.0 compatibility, and portability to UNIX. And Informix's exclusive Dynamic Scalable Architecture™, so it can grow to accommodate any size department.

If you want to try it out yourself, just visit our Web site at **www.informix.com/wgs** and download the OnLine Workgroup Server for a free 60-day trial.

Or call **1-800-274-9464** and ask for it on CD.

And start a workgroup productivity revolution of your own.

INFORMIX®

© 1996 Informix Software Inc. The following are worldwide trademarks of Informix Software, Inc. or its subsidiaries registered in the United States as indicated by ® and in numerous other countries worldwide: INFORMIX® OnLine Workgroup Server™, OnLine Dynamic Server™, Dynamic Scalable Architecture™. All other company and product names may be trademarks of their respective owners.

The SDK For This Inc Object-Oriented Databa

There's A Jasmine Seminar Near You.

Albany, NY	Nov. 18	Milwaukee, WI	Sep. 13
Albuquerque, NM	Oct. 28	Minneapolis/St. Paul, MN	Sep. 16
Atlanta, GA	Oct. 16	Montgomery, AL	Oct. 9
Birmingham, AL	Oct. 11	Nashville, TN	Sep. 27
Calgary, Alb., Can.	Dec. 3	Norfolk, VA	Oct. 29
Charlotte, NC	Oct. 21	Oklahoma City, OK	Sep. 18
Chicago, IL	Sep. 11	Omaha, NE	Sep. 25
Cleveland, OH	Dec. 10	Parsippany, NJ	Nov. 15
Columbia, SC	Oct. 18	Philadelphia, PA	Nov. 11
Dallas/Ft. Worth, TX	Oct. 18	Phoenix, AZ	Nov. 1
Denver, CO	Sep. 12	Pittsburgh, PA	Dec. 12
Des Moines, IA	Sep. 27	Raleigh/Durham, NC	Oct. 25
Detroit, MI	Dec. 5	Richmond, VA	Oct. 31
Edmonton, Alb., Can.	Dec. 5	Rochester, NY	Nov. 21
Houston, TX	Oct. 21	Sacramento, CA	Nov. 13
Irvine, CA	Nov. 6	San Antonio, TX	Oct. 25
Jackson, MS	Oct. 15	San Diego, CA	Nov. 4
Jacksonville, FL	Sep. 30	San Francisco, CA	Nov. 15
Jersey City, NJ	Nov. 13	San Jose, CA	Nov. 18
Kansas City, MO	Oct. 1	St. Louis, MO	Oct. 3
Knoxville, TN	Oct. 11	Tampa, FL	Oct. 2
Lexington, KY	Oct. 9	Tucson, AZ	Oct. 30
Little Rock, AR	Sep. 23	Tulsa, OK	Sep. 20
Los Angeles, CA	Nov. 8	Washington, DC	Nov. 8
Louisville, KY	Oct. 7	Wichita, KS	Sep. 16
Memphis, TN	Sep. 25	Winnipeg, Man., Can.	Sep. 20
Miami, FL	Oct. 4	Winston-Salem, NC	Oct. 23

20th anniversary
COMPUTER® ASSOCIATES
Software superior by design.

redible Multimedia, se For The Web Is FREE!

Jasmine™ has everything you need to develop the killer app of tomorrow.

It's a true multi-platform, object-oriented database that supports all multimedia datatypes, including video, audio and animation. Make your apps sizzle as you leave behind all of the limitations of relational and hybrid databases and all the frustrations of today's limited, multimedia development tools.

Jasmine has a fully integrated, development environment for visual, object-oriented, drag-and-drop media authoring. It has rich multimedia classes of preexisting objects and browsers for viewing classes, objects, queries, methods and specs. And it comes with a Method Editor for viewing method characteristics, and has "wizard-style" assistant aids for writing efficient queries. Your application can even be deployed as a Web browser plug-in. Write it once and run it anywhere: Internet, Intranet and client/server.

Call and apply today. It's your free ticket to the brave new world of object-oriented, multimedia development and the quickest way to achieve your true potential.

Call 1-888-7JASMINE to apply for a FREE Jasmine Training Seminar and a FREE Jasmine SDK. Or visit us at www.cai.com

©1996 Computer Associates International, Inc., Islandia, NY 11788-7000. All other product names referenced herein are trademarks of their respective companies.

PowerPC chip blows past Intel

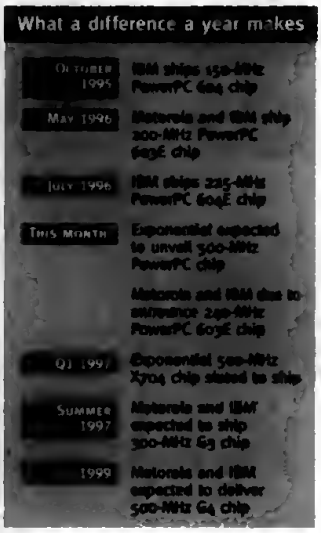
By Lisa Picarille

The PowerPC market will get a boost next week when Motorola, Inc. and IBM as well as start-up Exponential Technology, Inc. announce new PowerPC chips. The chips will be unveiled at the Microprocessor Forum conference in San Jose, Calif.

The biggest performance increase is expected to come from Exponential's X704 chip, a 500-MHz PowerPC chip. The San Jose, Calif., company, which boasts Apple Computer, Inc. as a financial supporter, is expected to begin shipping the chip in volume during the first quarter of 1997.

Apple and Macintosh clone makers Power Computing Corp., Umax Computer Corp. and DayStar Digital, Inc. are prepping machines based on the 500-MHz chip. Most are due next summer, sources said.

Industry observers warned that there are roadblocks to achieving that increased speed — a huge leap in clock speed over the current crop of 225-MHz PowerPC chips. The X704 could be hampered by the current Macintosh bus architecture and cache configurations.


What a difference a year makes
OCTOBER 1995
IBM ships 150-MHz PowerPC 604 chip
MAY 1996
Motorola and IBM ship 200-MHz PowerPC 603E chip
JULY 1996
IBM ships 225-MHz PowerPC 604E chip
THIS MONTH
Exponential expected to unveil 500-MHz PowerPC chip
Motorola and IBM due to announce 240-MHz PowerPC 603E chip
Q1 1997
Exponential 500-MHz X704 chip slated to ship
SUMMER 1997
Motorola and IBM expected to ship 300-MHz G3 chip
1999
Motorola and IBM expected to deliver 500-MHz G4 chip

Still, users said they were excited by the potential performance increase.

"This is the leap [over Intel] that everyone has been waiting for," said Victor Nazarian, MIS director at Harbour Inn Convalescent Medical Center in Baltimore. "With double the clock speed, I would like to get my hands on the machines as soon as possible."

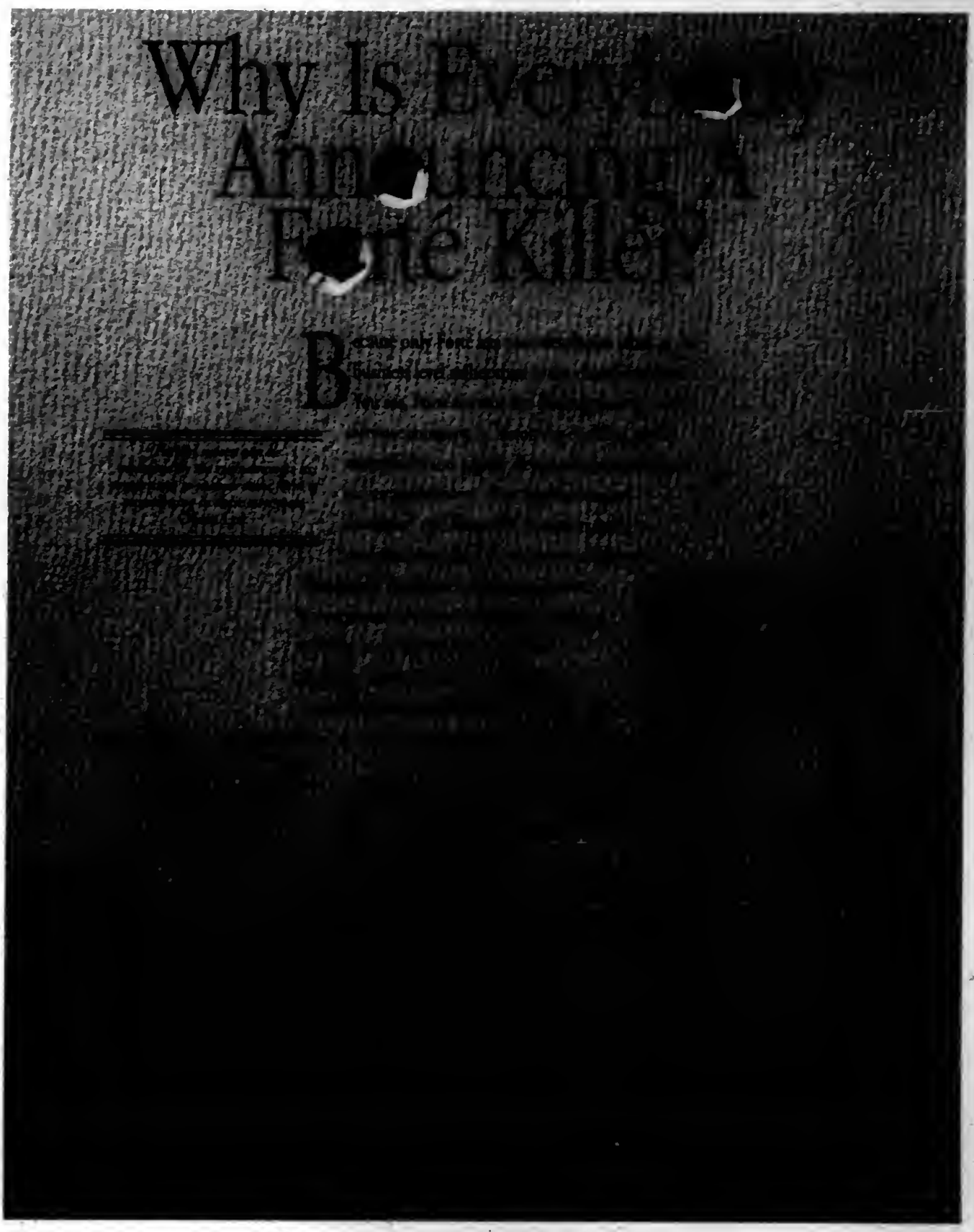
Mike Feibus, an analyst at Mercury Research in Scottsdale, Ariz., warned that clock speed alone isn't an accurate measure of how much faster the chip is. Still, 500 MHz tops anything available in the Intel Corp. and PowerPC markets.

"It'll be a while before Intel hits that level of performance," Feibus said. He said Intel's Pentium Pro is expected to reach speeds of 300 MHz by the end of next year.

Motorola and IBM also are expected to have a 500-MHz PowerPC chip, but not until 1999.

Exponential's first offering will take over as the high-end flagship PowerPC processor. That title was intended for the PowerPC 620 that Motorola and IBM are developing, but the 620 is more than a year late. No new delivery date has been announced.

In the meantime, Motorola and IBM will also take the wraps off their fastest PowerPC processor to date: a 603E that runs at 240 MHz. Two months ago, Power Computing announced a high-end system, the PowerTower 240, based on that chip. Apple is also readying 240-MHz 603E systems, sources close to the Cupertino, Calif., company said.


Why Is
B

A FEW WORDS FROM KENT LANE, V.P. POST SALES OPERATIONS AT METRIX, ON WHY UNIFACE IS THE ANSWER FOR BUILDING BUSINESS-CRITICAL, 7x24 CLIENT/SERVER APPLICATIONS.
FOR THE UNIFACE SUCCESS STORY SERIES, CALL US AT 1 800 365 3606, OR VISIT AT HTTP://WWW.COMPUWARE.COM
COMPUWARE®

UNIFACE
UNIFACE
UNIFACE
UNIFACE *WHAT THE BIG GUYS USE*

Apple's turnaround efforts bear fruit

By Lisa Picarille

Cost cutting, restructuring, a decline in excess channel inventory and anticipated new products, seem to have put Apple Computer, Inc. on the road to financial recovery.

At least for the short term.

But concerns linger that unless Apple can stop its market-share erosion, recovery may hit a dead end.

Apple is expected to announce earnings Oct. 16, and Wall Street analysts predict that Apple's financials will be on the upswing in the next two quarters.

"Apple's return to profitability is forecasted to occur in the March quarter next year," said Eugene Glazer, an analyst at Dean Witter Reynolds in New York. "It's possible that could occur as early as the December quarter."

Historically, the buying frenzy of the Christmas season makes the last three months of the year Apple's most profitable. This year, the company hopes to entice holiday shoppers with new products across its PowerBook, Performa, Power Macintosh and Newton families.

Apple's financials

Q4 1995	$60M	$3B
Q1 1996	-$69M	$3.15B
Q2 1996	-$740M	$2.2B
Q3 1996	-$32M	$2.17B

Glazer estimates that Apple's revenue will drop 23%. "On the revenue side, business is not good," he said. "They need to stop market-share erosion."

One analyst said Apple's sales and revenue may not be on the upswing, but there is a bright side.

"There hasn't been any share gain, but demand for Apple product is outpacing supply," said Vadim Zlotnikov, an analyst at Sanford C. Bernstein & Co. in New York. "From what I can tell, margins on the products they are selling are higher than [what are being garnered within] the overall PC market," he said. Zlotnikov predicted only a "slight loss in the fourth [calendar] quarter."

Operating system

Although Macintosh clones may be cannibalizing Apple's sales in the short term, for long-term stability Apple needs to more broadly license its Mac OS, according to industry watchers.

"It's what Apple has to do to expand the market," Zlotnikov said.

But to appeal to potential licensees, Apple needs a more compelling operating system strategy, analysts said.

Some industry observers have criticized Apple's recent decision not to deliver Mac OS 8, code-named Copland, but rather provide periodic updates to its operating system.

"The OS story is really hurting," said David Card, an analyst at International Data Corp. in Mountain View, Calif. "Copland isn't going to work, and now Apple needs to figure out what will work."

COMPUTERWORLD
CUSTOM PUBLICATIONS

The Computerworld Custom Publications Program

Your Technology Solution Showcase

"Computerworld's Custom Publications Program helped us successfully communicate Novell's key business messages to the right audience."

"As a media and marketing communications agency, The Martha Felt Group is always looking for innovative ways to meet our clients' communications needs. To best help Novell tell the world about its products and services, we decided an insert would offer the best advertising real estate for the money.

And we were right. Computerworld's Custom Publications Program gave us the flexibility to craft and distribute a publication that was both informative and insightful. Computerworld took care of all the details and provided us with an appropriate media vehicle that focused on our client's target audience.

In addition, this publication was successful in highlighting the contributions of Novell's partners in helping Novell deliver complete solutions to customers.

And talk about marketing muscle. Novell and its partners are using the publication for direct mail purposes, in sales kits, and as an effective marketing tool at various trade shows and events.

If our client is happy, we're happy. With Computerworld's Custom Publications Program, everybody wins."

Carrie Gaykowski
Senior Director
Marketing/Communications Services
The Martha Felt Group

For more information, please contact Carolyn Medeiros, Publishing Services Director, Boston 1-800-343-6474

NORTH/CENTRAL FLORIDA CAREERS
WILL BE FEATURED IN COMPUTERWORLD'S NOVEMBER 4 EDITION
DEADLINE: OCT 31, 3PM

The NCR Scalable Data Warehouse.

EMC, NCR to Demonstrate Largest Data Warehouse
By a Wall Street Journal Staff Reporter
HOPKINTON, Mass. – EMC Corp. and NCR Corp. tomorrow will unveil what is believed to be the world's largest data warehouse, containing 11 terabytes, or 11

Only we can make news this big.

#1 IN DATA WAREHOUSING

Once again, NCR is leading the way in data warehousing. Using NCR's robust Teradata® database and EMC² intelligent storage, coupled with our highly scalable WorldMark™ servers, we built the world's first data warehouse large enough to handle 11 terabytes of data. Or 275 billion pages of text.

NCR's WorldMark servers with EMC's Symmetrix® storage allow you to turn mountains of raw data into useful information with unprecedented speed, giving you unmatched querying capabilities. And only WorldMark servers offer you a platform that scales from SMP, to clusters, to MPP, allowing you to start your data warehouse small and grow it to any size.

To get more information about NCR's scalable data warehouse, call 1 800 CALL-NCR, ext. 3000. Or experience our data warehousing capabilities firsthand at: http://www.ncr.com. Or visit http://www.emc.com

intel inside pentium

EMC² THE STORAGE ARCHITECTS

NCR

All WorldMark servers shown feature Intel Pentium processors. The Intel Inside and Pentium Processor logos are registered trademarks of Intel Corp. The Wall St. Journal, 2/27/96. Reprinted from The Wall St. Journal ©1996 Dow Jones & Co., Inc. All rights reserved. EMC² and Symmetrix are registered trademarks and EMC is a trademark of EMC Corporation. Teradata is a registered trademark and WorldMark is a trademark of NCR Corp. ©1996 NCR Corporation. All rights reserved.

Data warehousing option #1: Build it yourself.

You'll have to 1) Get a relational database to hold the information and avoid burdening the centralized IS resources of your operational database. 2) Get a metadata cataloging tool to define your data sources and map them to the data warehouse. This will enable you to track where your decision support data comes from and search the contents of the warehouse. 3) Get an extraction and transformation tool to pull data from the operational database and deposit it in the warehouse. Still with us? Good. 4) Get an information access tool to bridge the warehouse to the applications currently running across your enterprise. 5) Get a query tool to reach data stored on multiple platforms and to browse data search results. And get a data analysis tool to analyze complex information patterns. 6) Perhaps it's time you took a vacation as you've probably put in a good six months by now. Of course, when you get back, you'll have to get a World Wide Web connection to allow access to your warehouse via the Internet. 7) Hand code the links between the tools to create one integrated, operational data warehouse resource. Think you're done? Hold the champagne. 8) Extract data from original operational databases and transfer it to the warehouse in raw data form. Follow that? Then let's continue. 9) Filter the information from millions of rows of data to smaller units of usable data rows. 10) Create a metadata catalog to allow information to be found easily and quickly. That *is* why you got into this mess in the first place, isn't it? 11) Update and refresh the data and data warehouse to avoid compromise of overall data integrity. Sounds simple enough. Now try doing it for nine hours a day, because that's what it takes. 12) Finally. Hire extra staff to maintain data warehouse security, integrity, component integration and vendor contact. By the way, salaries start in the high sixties.

Now you don't have to wrestle with technology to get your data warehouse up and running. Visual Warehouse puts everything in place for you, much faster and for a fraction of the cost. You can extract data from Oracle, SQL Server, Sybase, Informix, IMS, DB2® and others, use query tools such as those

IBM and DB2 are registered trademarks and Solutions for a small planet is a trademark of International Business Machines Corporation. All other company and/or product names are trademarks or registered trademarks of their respective companies. IBM reserves the right to modify or withdraw these promotions at any time. © 1996 IBM Corp. All rights reserved.

Option #2: Get Visual Warehouse.

from Lotus® and Microsoft,® and use data analysis tools from Arbor, Andyne, Business Objects, Brio and Cognos. Visit www.software.ibm.com/data/warehouse/vw to download a free demo and see how easy it is to make the right choice, Visual Warehouse.

Solutions for a small planet™ IBM.

Time is taxing

1960
The IRS makes the first major automation with the Tax Administration System

1968
The IRS determines tax systems, based on 1950s concepts, need to be replaced. It launches a first attempt to modernize systems.

1978
The White House cancels the tax system overhaul, citing concerns about privacy and security.

1982
The IRS launches a second tax system replacement program, Tax System Redesign. Goals: upgrade hardware, speed information access, link related data, automate manual activities.

1985
The Treasury Department disapproves the IRS' project plan, saying the objectives are too general and the plan would outsource too much.

1986
The IRS wins Treasury approval for a third approach to redesign. The Treasury says it is troubled by lack of progress on the project.

1988
Oversight agencies express concern about the complexity of the huge program, which the IRS estimates at $4.4 billion and expects to be completed in 1998.

1988
The IRS begins planning the Document Processing System (DPS), the key to its strategy of paperless processing of tax returns.

1990
The GAO faults the IRS for not having a master plan for the project – now called Tax System Modernization (TSM).

1991
The IRS' design master plan "does not address key issues vital to success of the modernization," the GAO says.

1992
The IRS' "planning, technological readiness and procurement and systems development processes" are badly flawed, the GAO says.

Special Report:

IRS: Tough to get any respect

By Gary H. Anthes

The IRS has agreed with much of the criticism leveled at it over the years, but the agency claims it hasn't gotten the credit it deserves for having made substantial improvements to its systems.

"All this criticism is leveled by people who can't recognize a huge amount of progress," said Hank Philcox, former chief information officer at the IRS and now CIO at DynCorp in Reston, Va. "We wasted $2.5 billion? No, we built an infrastructure. To say we made no progress ignores where we started from."

Philcox said that when he assumed responsibility for TSM in 1986, the IRS' computer systems were on the verge of collapse. Underpowered mainframes and inefficient software took five days to do "weekend" file updates. The 1985 tax-filing season was an information systems and public relations disaster as tax refunds to 85 million individuals suffered long delays.

Essentially no data was available online, so IRS workers relied on tons of paper documents and computer printouts. Updates to the master file — on some 3,000 magnetic tapes — were propagated to regional centers by flying tapes across the country.

As a result of the 1985 fiasco, the IRS established three key systems priorities: boost computer power and optimize existing software, connect IRS centers with a high-speed data network and automate the manual processes of case workers by getting key tax information online. By the early 1990s, Philcox said, automation plus the network had reduced processing delays and manual effort so much that the IRS was able to eliminate 4,500 clerical positions.

Philcox said the new Integrated Collection System, scheduled for full implementation in 1998, has improved by 30% the productivity of case workers where it is installed. But final rollout of that system — and other worthwhile systems in the development pipeline — depends on the IRS' future budget for the Tax Systems Modernization program, said Mark Cox, director of the IRS' southwest district.

The IRS' ex-CIO Hank Philcox: *'To say we made no progress ignores where we started from'*

The budget and plans for this latest collection system are under review by the IRS. Cox said the IRS has accomplished much over the past five years. "I don't think it's a totally negative story at all," he said. "I keep hearing people externally saying we haven't gotten the message, but folks internally have gotten the message on what needs to be done, and they are trying real hard."

The agency has also been listening lately to the siren song of outsourcing. Declaring that its expertise is in taxes, not systems, it has been parceling out more pieces of TSM.

Philcox agreed with the GAO's call for the IRS to do business process reengineering, but he said the IRS' decision to automate only existing processes was the correct one at the time.

"Our strategy all along was to get the near-term improvements and to ensure a return on investment as we went along," he said. "And we did that."

Failures cost taxpayers $50B

CONTINUED FROM PAGE 1

from 87% of amounts due today to 90% by 2001. At current collection levels, that 3% is worth about $50 billion per year, or more than $500 per U.S. household.

"The opportunity costs of not doing tax systems modernization are huge," said Lynda Willis, director of tax policy and administration issues at the U.S. General Accounting Office in Washington. "System improvements are necessary for getting to that 90%."

"I've seen abuse of the tax system that would turn your stomach," said Hank Philcox, former chief information officer at the IRS. "You wouldn't believe what some people get away with, and information technology can offset a lot of that unfairness."

But it doesn't — at least not yet. The IRS has 8,500 people in information systems management and development, and 2,000 of them are assigned to tax systems modernization. A recent estimate by a committee of the National Research Council in Washington said there are 10 outside contractors working on the Tax Systems Modernization (TSM) program for every IRS employee on the project.

IRS Commissioner Margaret Richardson: *'We recognize that our software capabilities, as well as those of our contractors, must be improved'*

"The IRS has spent $4 billion on TSM so far and has basically nothing to show for it," said Rep. Jim Lightfoot (R-Iowa), chairman of the House committee that approves IRS funding. He is one of the IRS' most vocal critics.

Although the IRS has made some progress in recent years in improving its computer systems (see story, next page), critics have trained a harsh spotlight on some troubled development activities at the agency.

According to government and private groups that have reviewed the IRS' systems work over the years, the agency's biggest problems center on several key areas. They say the agency has done the following:

- Failed to do much-needed business process redesign before it began its systems development.
- Neglected to develop an overall systems architecture or development blueprint.
- Employed primitive and, at times, "chaotic" software development methodologies.
- Failed to manage information systems as investments.
- Neglected information security.

"We recognize that our software development capabilities, as well as those of our contractors, must be improved," said IRS Commissioner Margaret Richardson. "We have taken steps in that direction."

To appease its critics, the IRS has made several major adjustments in its approach to the massive modernization program, which is a collection of about 50 projects. The agency last year overhauled its TSM plans, scaling back some activities and postponing others.

Cutting back

"Perhaps we took on too much, and we cannot afford to do all this at once," acknowledged Marilyn Soulsburg, a TSM executive at the IRS. She said the agency has decided to outsource more of the program and to cut back individual development efforts to no more than two-year projects.

But outsourcing won't be a "silver bullet," said Rona Stillman, chief scientist for computers and communications at the GAO. Her agency has written dozens of reports criticizing TSM management. "They'll do no better with outsourcing than they have with in-house development unless they can institute some discipline," she said.

Some earlier outsourced work, such as the $1.3 billion Document Processing System (DPS), has produced dubious results so far. Intended to scan and capture data from incoming tax forms, the DPS

was conceived in 1988 as a cornerstone of the IRS' strategy for automating manual and paper-intensive processes. It was also considered essential to meeting TSM's quality and cost goals.

But after having spent nearly $300 million on the DPS, the IRS last week officially pulled the plug on the project. It blamed the cancellation on "revised priorities and budget realities."

"They are now looking at very basic things — such as what forms to scan and what data to capture — after spending hundreds of millions of dollars [on DPS]," Stillman said. "Why are they asking requirements questions so late in the game?"

Cybermess with CyberFile. Stillman also pointed to the IRS' CyberFile project for electronic filing of returns. CyberFile was contracted out last year, but it collapsed last month under mismanagement after costing $17 million.

"It was planned badly, contracted badly and built badly," she said.

In a letter to the House Governmental Affairs Committee, Stillman outlined 49 lapses in security alone in the CyberFile project. They included a hole in a data center wall large enough to walk through and passwords shared by employees and posted in public places.

"The bottom line is none of our recommendations have been implemented — none," Stillman said. "Why? There is no organizational will. It's a matter of discipline, and nowhere have they exerted discipline."

In a written reply to that charge, the IRS told *Computerworld* it is "committed to implementing a more rigorous, disciplined approach to designing, developing and managing" IS investments. Next year will be "a transition year for TSM" in that regard, the agency said.

And while Congress rails, the GAO scolds and the IRS flounders, taxes go uncollected, shifting the tax burden to those who do pay their fair share.

When asked at a recent congressional oversight hearing how the agency can improve the collection of taxes, IRS Commissioner Richardson said, "Implementing the technology modernization program is vital."

Richardson said productivity increases from TSM will "translate directly into additional tax collections in the bank."

The TSM initiatives aimed specifically at increasing tax collections include the following:

- The Compliance Research Information System, which includes a sample database on which the IRS can model the effects of alternate compliance strategies. It is projected to increase tax collections $2.9 billion per year.
- The Corporate Accounts Processing System, which is the central taxpayer account database and processing system at the heart of TSM. It will let the IRS perform extensive compliance checks, such as income and withholding validations, before fraudulent refunds are made. Today, those compliance checks are usually done after the fact.
- New statistical tools, which will be used to spot suspicious returns and evaluate the effectiveness of compliance techniques.

> *"The IRS has spent $4 billion on TSM so far and has basically nothing to show for it."*
>
> — Rep. Jim Lightfoot (R-Iowa)

The IRS has already shown that modest system improvements can boost tax collections considerably. With new and improved "computer filters," the IRS last year spotted and rejected 4.1 million suspicious electronic returns. That is up fourfold from the previous year.

The people who filed those returns were notified of the problems, which included an invalid Social Security number. But an audit later discovered that 29% of the rejected electronic returns were refiled on paper — with exactly the same errors — and resulted in refunds being paid. But there is no data available on how much money was lost in fraudulent refunds.

And better computer checking of 1 million suspicious paper returns, coupled with more vigorous follow-up by IRS examiners, yielded $800 million in added revenue and reduced refunds last year.

Despite those bright spots in an otherwise gloomy record, Willis said recent changes in TSM plans cast doubts on the IRS' ability to increase overall compliance from the current 87% to 90%, the 3% difference that would put $50 billion more a year into federal coffers.

For example, the agency has postponed indefinitely its Taxpayer Compliance Measurement Program, the primary program for getting taxpayer compliance data. It also put on hold until after 2000 the ability to do up-front matching of tax returns and information returns such as W-2 and 1099 forms. Repeated requests by *Computerworld* to find out why these programs were delayed went unanswered by the IRS.

1992

The IRS' approach to data input, including the DPS, is "high-tech, high-risk and high-cost." – GAO report

1993

"Significant problems and delays" cited in three key IRS systems by the GAO. The GAO also cited "unfinished studies of the IRS' business operations" that should have been reflected in 1991 master plan.

1994

The IRS awards a 15-year, $1.3 billion contract to IBM for DPS. The amount is three times more than 1991 estimated cost of $379 million.

FEBRUARY 1995

"After eight years and an investment of $2 billion, the IRS' progress toward its vision has been minimal. Unmanaged risks threaten success." Completed systems bring "marginal benefits." – GAO report

DECEMBER 1995

The IRS "re-scopes" TSM, decides to increase the amount of work outsourced from 40% to 66%.

DECEMBER 1995

National Research Council finds "serious deficiencies" in the IRS' technical management, systems architecture, process improvement and systems security.

MARCH 1995

The IRS has "provided little tangible evidence that actions being taken will correct the pervasive management and technical weaknesses that place TSM, and the huge investment it represents, at risk." – GAO report

MAY 1996

After spending $270 million on the DPS, the IRS "is uncertain whether the benefits outweigh the costs." The IRS postpones the DPS pilot scheduled for January 1997.

SUMMER 1996

The Senate and House say they will cut the TSM budget and the DPS by 50% for 1997.

OCTOBER 1996

The IRS pulls the plug on troubled CyberFile and the DPS projects. Cost to date: $300 million.

JOEL BOWLS ILLUSTRATIONS

Special Report: TAX SYSTEMS FIASCO

40 whacks with the budget ax

The IRS has proved an irresistible target in this election year. Reform Party candidate Ross Perot would abolish the agency altogether, and Bob Dole would reduce IRS staff by 30%. Meanwhile, Congress recently slashed the IRS' 1997 budget request for TSM by almost 50%.

"It's clear we can no longer give the IRS a blank check for TSM," said Rep. Jim Lightfoot (R-Iowa), chairman of the Treasury, Postal Service and General Government Subcommittee. "We cut [the total agency budget] 2% two years ago, and they squealed like stuck pigs, so we cut it 11% this year."

The IRS' 1997 funding, which Congress approved last month, earmarks $420 million for TSM. The funding legislation directs the IRS "to transfer, by July 31, 1997, a majority of TSM development, deployment, management and testing to the private sector."

It also directs the IRS, by October 1997, to carry out the following recommendations from the GAO:

- **Implement a rigorous process for selecting, prioritizing, controlling and evaluating major IS investments.**
- **Improve systems development practices from ones that are ad hoc to ones in which process discipline ensures that successes can be repeated.**
- **Develop enterprisewide system blueprints — including an integrated system architecture, security and data architectures and configuration management.**

The IRS said it intends to comply with Congress' wishes.

The budget reductions for the IRS "are both penny and pound foolish," said Deputy Treasury Secretary Lawrence Summers. He cited an IRS study that showed the agency collects $4.25 in tax revenue for every dollar it spends on tax-compliance measures.

Speaking recently to an American Bar Association convention, Summers said cutting collection efforts will add as much as $1 billion to the deficit next year alone. "The IRS is too convenient a political target; it's politically popular to beat up on the IRS," said former IRS CIO Hank Philcox.

True enough, but even the tax system watchdog committees have tried to help out with some "Systems 101" advice for the IRS. Among their suggestions were to hire more technically proficient managers, develop real metrics for IS performance and enforce standard interfaces on key applications.

"A lot of what has been developed could be rolled out today if they just had the funds," Philcox said. He cited two new systems that automate paper-intensive processes that have proved effective at a few sites but are being delayed by budget cuts.

— Gary H. Anthes

Fred Prouser

Rep. Jim Lightfoot: "It's clear we can no longer give the IRS a blank check for [Tax Systems Modernization]"

was conceived in 1988 as a cornerstone of the IRS' strategy for automating manual and paper-intensive processes. It was also considered essential to meeting TSM's quality and cost goals.

But after having spent nearly $300 million on the DPS, the IRS last week officially pulled the plug on the project. It blamed the cancellation on "revised priorities and budget realities."

"They are now looking at very basic things — such as what forms to scan and what data to capture — after spending hundreds of millions of dollars [on DPS]," Stillman said. "Why are they asking requirements questions so late in the game?"

Cyberness with CyberFile

Stillman also pointed to the IRS' CyberFile project for electronic filing of returns. CyberFile was contracted out last year, but it collapsed last month under mismanagement after costing $17 million.

"It was planned badly, contracted badly and built badly," she said.

In a letter to the House Governmental Affairs Committee, Stillman outlined 49 lapses in security alone in the CyberFile project. They included a hole in a data center wall large enough to walk through and passwords shared by employees and posted in public places.

"The bottom line is none of our recommendations have been implemented — none," Stillman said. "Why? There is no organizational will. It's a matter of discipline, and nowhere have they exerted discipline."

In a written reply to that charge, the IRS told *Computerworld* it is "committed to implementing a more rigorous, disciplined approach to designing, developing and managing" IS investments. Next year will be "a transition year for TSM" in that regard, the agency said.

And while Congress rails, the GAO scolds and the IRS flounders, taxes go uncollected, shifting the tax burden to those who do pay their fair share.

When asked at a recent congressional oversight hearing how the agency can improve the collection of taxes, IRS Commissioner Richardson said, "Implementing the technology modernization program is vital."

Richardson said productivity increases from TSM will "translate directly into additional tax collections in the bank."

The TSM initiatives aimed specifically at increasing tax collections include the following:

- The Compliance Research Information System, which includes a sample database on which the IRS can model the effects of alternate compliance strategies. It is projected to increase tax collections $2.9 billion per year.
- The Corporate Accounts Processing System, which is the central taxpayer account database and processing system at the heart of TSM. It will let the IRS perform extensive compliance checks, such as income and withholding validations, before fraudulent refunds are made. Today, those compliance checks are usually done after the fact.
- New statistical tools, which will be used to spot suspicious returns and evaluate the effectiveness of compliance techniques.

> *"The IRS has spent $4 billion on TSM so far and has basically nothing to show for it."*
>
> **— Rep. Jim Lightfoot (R-Iowa)**

The IRS has already shown that modest system improvements can boost tax collections considerably. With new and improved "computer filters," the IRS last year spotted and rejected 4.1 million suspicious electronic returns. That is up fourfold from the previous year.

The people who filed those returns were notified of the problems, which included an invalid Social Security number. But an audit later discovered that 29% of the rejected electronic returns were refiled on paper — with exactly the same errors — and resulted in refunds being paid. But there is no data available on how much money was lost in fraudulent refunds.

And better computer checking of 1 million suspicious paper returns, coupled with more vigorous follow-up by IRS examiners, yielded $800 million in added revenue and reduced refunds last year.

Despite those bright spots in an otherwise gloomy record, Willis said recent changes in TSM plans cast doubts on the IRS' ability to increase overall compliance from the current 87% to 90%, the 3% difference that would put $50 billion more a year into federal coffers.

For example, the agency has postponed indefinitely its Taxpayer Compliance Measurement Program, the primary program for getting taxpayer compliance data. It also put on hold until after 2000 the ability to do up-front matching of tax returns and information returns such as W-2 and 1099 forms. Repeated requests by *Computerworld* to find out why these programs were delayed went unanswered by the IRS.

1992

The IRS' approach to data input, including the DPS, is "high-tech, high-risk and high-cost."
GAO report

1993

"Significant problems and delays" cited in three key IRS systems by the GAO. The GAO also cited "unfinished studies of the IRS' business operations" that should have been reflected in 1991 master plan.

1994

The IRS awards a 15-year, $1.3 billion contract to IBM for DPS. The amount is three times more than 1991 estimated cost of $379 million.

FEBRUARY 1995

"After eight years and an investment of $2 billion, the IRS' progress toward its vision has been minimal. Unmanaged risks threaten success." Completed systems bring "marginal benefits." – GAO report

DECEMBER 1995

The IRS "re-scopes" TSM, decides to increase the amount of work outsourced from 40% to 66%.

DECEMBER 1995

National Research Council finds "serious deficiencies" in the IRS' technical management, systems architecture, process improvement and systems security.

MARCH 1995

The IRS has "provided little tangible evidence that actions being taken will correct the pervasive management and technical weaknesses that place TSM, and the huge investment it represents, at risk." – GAO report

MAY 1996

After spending $270 million on the DPS, the IRS "is uncertain whether the benefits outweigh the costs." The IRS postpones the DPS pilot scheduled for January 1997.

SUMMER 1996

The Senate and House say they will cut the TSM budget and the DPS by 50% for 1997.

OCTOBER 1996

The IRS pulls the plug on troubled CyberFile and the DPS projects. Cost to date: $300 million.

Nick Bowey illustration

Special Report: TAX SYSTEMS FIASCO

Learning lessons from IRS' biggest mistakes

By Joseph Maglitta

The serious and costly delays in the Internal Revenue Service's Tax Systems Modernization program are rooted in deep cultural, political and organizational problems within that agency, many observers agree.

Yet even so, experienced information systems executives, megaproject managers and consultants say the decadelong project has much to teach other organizations tackling major technology projects.

Americans for Tax Reform's Grover Norquist *says the IRS should have patterned its approach on systems used at 'service-minded' companies, not other governments*

Some of those lessons are painfully obvious: The keys to success remain strong leadership, technical competence and clearly stated goals and targets. Other nuggets of advice include the following:

● **Avoid big bangs.** "The words 'IT' and 'megaprojects' do not belong in the same sentence," said Gopal K. Kapur, president of the Center for Project Management in San Ramon, Calif. He and others advise "chunking" projects into small, stand-alone modules that deliver value in themselves. "You need to ask, 'If the project was halted today, would we be able to use what we delivered?' If the answer is no, go back," said John Hammitt, former chief information officer at United Technologies Corp. and now a vice president at Giga Information Group in Cambridge, Mass.

● **Pin down committed leadership.** At the IRS, critics say the lack of clear project champions has been a big problem.

The IRS has had three commissioners in five years and two deputy commissioners without technical backgrounds, said Robert P. Clagett. A 30-year AT&T Corp. veteran, Clagett headed the now-defunct Committee on Continued Review of the Tax Systems Modernization from 1990 to 1995. "The [IRS] said, 'It's an improvement and upgrade. We don't have to get involved.'"

Kapur advises project leaders to make a list of 10 to 15 responsibilities for executives. Ask how many hours per month they can devote to the project and whether they really have the time.

● **Use small time frames.** "I will not commit to any deliverable that requires more than 12 months," said Christopher P. Higgins, a vice president at BankAmerica Corp. in San Francisco. "By then, the technology has changed and the business has changed."

The key, he added, isn't skimping on the project's requirements. Sponsors may chafe, but don't hesitate to take three to six months to get a clear, detailed plan and business case.

● **Make sure you have the talent to do the work.** The IRS and other organizations balk at admitting when a job is beyond them. It has a "congenital disability" when it comes to attracting and retaining qualified systems management talent, "especially at the executive levels," said Paul A. Strassmann, former CIO of the U.S. Department of Defense and now a consultant in New Canaan, Conn.

● **Use your best people to manage subcontractors.** Critics say a big problem at the IRS is that major contractors, notably TRW, Inc., often are far sharper technically than the government employees who manage them. As a result, some charge, it is easy for the IRS to get buffaloed.

A simple remedy: Assign your sharpest managers to manage outsourcers.

"You see at a place like Xerox that spends $3 billion on outsourcing [that] the key senior managers are as strong and competent as those from the [Electronic Data Systems Corp.] organization," Hammitt said.

● **Set your customer service sights high.** Another major mistake the IRS made was comparing its tax service and systems with those in other countries, according to Grover Norquist, president of Americans for Tax Reform, a Washington-based lobbying group and member of the National Commission on IRS Restructuring.

Service-minded organizations should always aim much higher, he said. "Instead of comparing how you do with the French tax system, for example, you should be looking at American Express, Citibank" and other leading customer-friendly firms, Norquist said.

● **Start fresh if necessary.** Don't be afraid to kill a runaway project, said Michael Hammer, president of Hammer and Company in Cambridge, Mass.

"Burn it down and start again," he said. "By not doing that, you make the project worse."

Tax Systems Modernization

Area	Status
ELECTRONIC FEDERAL TAX PAYMENT SYSTEM Payment receipt via electronic funds transfer.	*In testing*
ELECTRONIC MANAGEMENT SYSTEM Electronic data interchange with taxpayers, banks and other agencies.	*Operational*
CYBERFILE Electronic filing from PCs and the Internet.	*Canceled October 1996*
TELEFILE Touch-Tone telephone filing of simple tax returns and forms.	*Operational for some filers*
SIMPLIFIED TAX AND WAGE REPORTING SYSTEM Reporting by businesses to government agencies.	*In prototype*
ELECTRONIC FILING	*Estimated cost to complete* **$440 MILLION**
DOCUMENT PROCESSING SYSTEM Character recognition and image processing of complex documents.	*Canceled October 1996*
[illegible]	[illegible]
PAPER FILING	*Estimated cost to complete* **UNKNOWN**
INTEGRATED CASE PROCESSING SYSTEM Telephone- and computer-based work environment to replace correspondence and face-to-face interaction with taxpayers.	*Some parts operational*
AUTOMATED SELF-SERVICE APPLICATIONS Internet-, PC- and voice-response-based technology to provide taxpayer assistance without interaction with IRS employees.	*Some features available*
CUSTOMER SERVICE	*Estimated cost to complete* **$1.2 BILLION**
INTEGRATED COLLECTION SYSTEM Automated case management and top computers for collection officers.	*Implemented at some sites; to be completed in 1998*
[illegible]	[illegible]
COMPLIANCE DATA WAREHOUSE Decision-support tools and data for forecasting and ad hoc studies of compliance strategies.	*Suspended*
[illegible]	[illegible]
ELECTRONIC FRAUD-DETECTION SYSTEM Software for spotlighting potentially fraudulent refund claims.	*Operational at some sites*
COMPLIANCE	*Estimated cost to complete* **UNKNOWN**
WORKLOAD MANAGEMENT SYSTEM Management and distribution of electronic case folders, and analysis and disposition of taxpayer accounts.	*Limited capability scheduled for 1997*
CORPORATE ACCOUNTS PROCESSING SYSTEM Central tax account database and tax processing system, including compliance problem detection.	*In design*
REVENUE GENERAL LEDGER SYSTEM Transaction-based revenue accounting.	*In design*
FACILITIES AND HARDWARE UPGRADES Consolidate data centers, upgrade mainframes, acquire file servers and build telecommunications infrastructure.	*Partially complete*
SUPPORT ACTIVITIES Software development environment, security environment and IS help desk.	*Partially complete*
FOUNDATION COMPONENTS	*Estimated cost to complete* **$1.3 BILLION**

Special Report:

Learning lessons from IRS' biggest mistakes

By Joseph Maglitta

The serious and costly delays in the Internal Revenue Service's Tax Systems Modernization program are rooted in deep cultural, political and organizational problems within that agency, many observers agree.

Yet even so, experienced information systems executives, megaproject managers and consultants say the decadelong project has much to teach other organizations tackling major technology projects.

Americans for Tax Reform's Grover Norquist *says the IRS should have patterned its approach on systems used at 'service-minded' companies, not other governments*

Some of those lessons are painfully obvious: The keys to success remain strong leadership, technical competence and clearly stated goals and targets. Other nuggets of advice include the following:

- **Avoid big bangs.** "The words 'IT' and 'megaprojects' do not belong in the same sentence," said Gopal K. Kapur, president of the Center for Project Management in San Ramon, Calif. He and others advise "chunking" projects into small, stand-alone modules that deliver value in themselves. "You need to ask, 'If the project was halted today, would we be able to use what we delivered?' If the answer is no, go back," said John Hammitt, former chief information officer at United Technologies Corp. and now a vice president at Giga Information Group in Cambridge, Mass.
- **Pin down committed leadership.** At the IRS, critics say the lack of clear project champions has been a big problem.

The IRS has had three commissioners in five years and two deputy commissioners without technical backgrounds, said Robert P. Clagett. A 30-year AT&T Corp. veteran, Clagett headed the now-defunct Committee on Continued Review of the Tax Systems Modernization from 1990 to 1995. "The [IRS] said, 'It's an improvement and upgrade. We don't have to get involved.'"

Kapur advises project leaders to make a list of 10 to 15 responsibilities for executives. Ask how many hours per month they can devote to the project and whether they really have the time.

- **Use small time frames.** "I will not commit to any deliverable that requires more than 12 months," said Christopher P. Higgins, a vice president at BankAmerica Corp. in San Francisco. "By then, the technology has changed and the business has changed."

The key, he added, isn't skimping on the project's requirements. Sponsors may chafe, but don't hesitate to take three to six months to get a clear, detailed plan and business case.

- **Make sure you have the talent to do the work.** The IRS and other organizations balk at admitting when a job is beyond them. It has a "congenital disability" when it comes to attracting and retaining qualified systems management talent, "especially at the executive levels," said Paul A. Strassmann, former CIO of the U.S. Department of Defense and now a consultant in New Canaan, Conn.
- **Use your best people to manage subcontractors.** Critics say a big problem at the IRS is that major contractors, notably TRW, Inc., often are far sharper technically than the government employees who manage them. As a result, some charge, it is easy for the IRS to get buffaloed.

A simple remedy: Assign your sharpest managers to manage outsourcers.

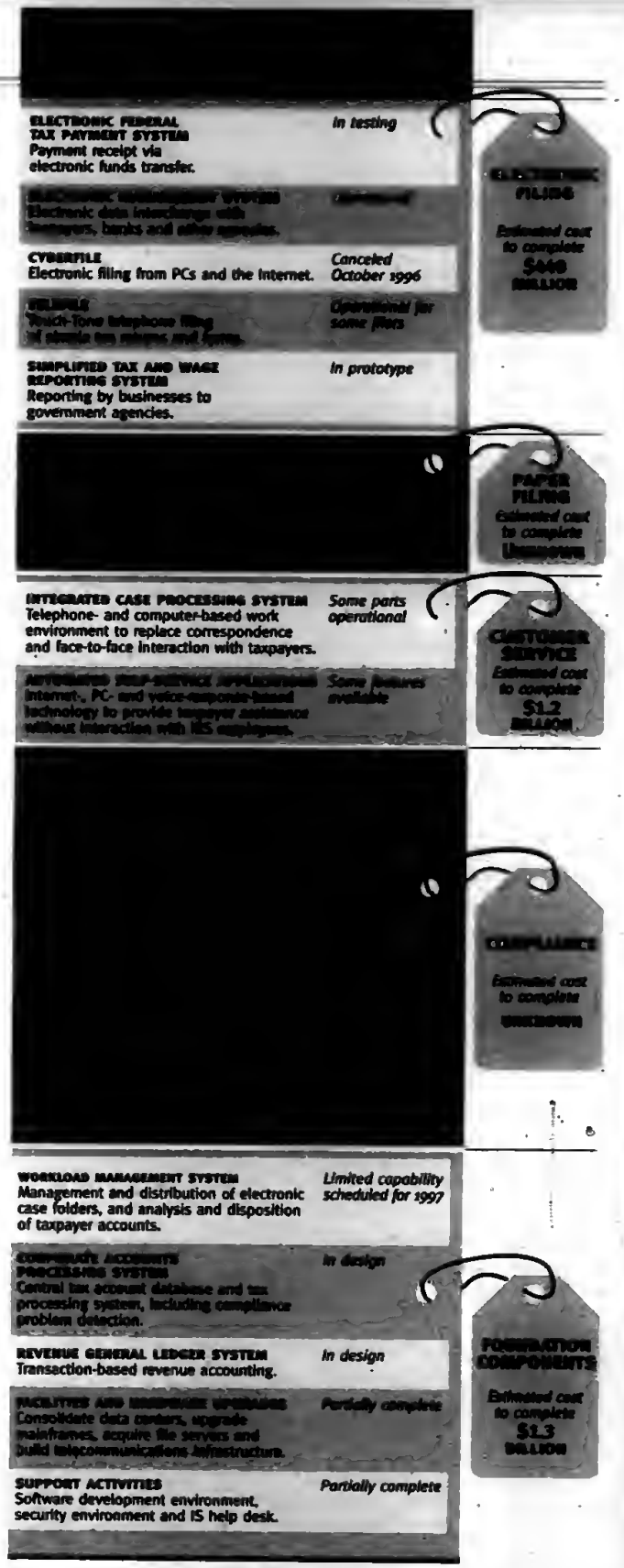
"You see at a place like Xerox that spends $3 billion on outsourcing [that] the key senior managers are as strong and competent as those from the [Electronic Data Systems Corp.] organization," Hammitt said.

- **Set your customer service sights high.** Another major mistake the IRS made was comparing its tax service and systems with those in other countries, according to Grover Norquist, president of Americans for Tax Reform, a Washington-based lobbying group and member of the National Commission on IRS Restructuring.

Service-minded organizations should always aim much higher, he said. "Instead of comparing how you do with the French tax system, for example, you should be looking at American Express, Citibank" and other leading customer-friendly firms, Norquist said.

- **Start fresh if necessary.** Don't be afraid to kill a runaway project, said Michael Hammer, president of Hammer and Company in Cambridge, Mass.

"Burn it down and start again," he said. "By not doing that, you make the project worse."



Three more reasons to choose PowerPC technology.

for Windows NT, StarMax for Mac OS and PowerStack II for AIX

As if you needed any more reasons to choose PowerPC™ architecture, Motorola has launched an entire line of desktops, workstations and servers running on PowerPC technology, including systems for Mac® OS, Windows NT® and AIX®. So there are even more systems out there with the definite advantage of PowerPC performance. In fact, recent BYTE *magazine tests proved that the PowerPC 603e™ and 604e™ microprocessors outperformed the Pentium® and Pentium® Pro, respectively.† Which is another good reason. And both the scalable design and technology road map of PowerPC architecture mean you'll have wider ranges of performance, power consumption and flexibility for years to come. Call 1-800-759-1107, ext. CW, or visit http://www.mot.com/computer/ to find out about PowerPC systems from Motorola and even more reasons to choose them.*

MOTOROLA

©1996 Motorola, Inc. All rights reserved. Motorola and Ⓜ are registered trademarks and PowerStack and StarMax are trademarks of Motorola, Inc. PowerPC 603e, PowerPC 604e, PowerPC and the PowerPC logo are trademarks of and are used under license from International Business Machines Corporation. All other brand and product names are the trademarks or registered trademarks of their respective holders. †August, 1996.

What you never thought possible.™

1-800-AUDIT-ME

I've shamelessly stolen the headline on this editorial from an old Dave Barry column in which the humorist suggested that anyone who criticizes the IRS in print might as well have that telephone number. And now that *Computerworld* has investigated the staggering fiasco of the Internal Revenue Service's 10 years of tax systems modernization, we should probably brace ourselves for the auditors. After all, they're the ones who finally got Al Capone.

But while we get our receipts in order, let's observe a moment of stunned silence for the $50 *billion* in lost annual revenue (see our lead story, page 1).

That $50 billion figure comes from calculating the opportunity cost of failure. It's the money the feds would be raking in if the IRS had delivered on what it's been promising taxpayers for years.

"The IRS has spent $4 billion on [Tax Systems Modernization] so far and has basically nothing to show for it," says Rep. Jim Lightfoot (R-Iowa), chairman of the House committee that approves IRS funding.

Reams of stories have been written about the various IS disasters plaguing the IRS' massive tax systems overhaul, which was supposed to automate and improve tax collection. But no one had ever calculated the hidden cost of the IRS failures until *Computerworld*'s investigation by Gary Anthes.

Just think of the things that $50 billion in lost revenue could buy. It could pay for about a quarter of our $200 billion-plus military budget. It could supply a $50,000 luxury sports utility vehicle to each of the 1 million or so good people in Lightfoot's home state of Iowa. It could even buy Bill Gates another new house.

What our stories make clear is that the IRS mainly failed at Common Sense 101 for systems development and planning. The agency ignored the basics of business process redesign, software development and even security fundamentals.

And speaking of fundamentals, I reckon it's time to go get our phone number changed....

Maryfran Johnson

Maryfran Johnson, *Executive editor*
Internet: *maryfran_johnson@cw.com*

Software testing merits more attention

Will *Computerworld*'s Annual Salary Survey ["Posh payoffs," Sept. 2] continue to ignore a career area with more people than 80% of the job areas you cover?

I am talking specifically about jobs in software testing (test manager, testware designer, tester) and more generally about software quality-related jobs, such as quality support/assurance, process re-engineering and configuration management. Roger Pressman in the September issue of *IEEE Software* reported on the results of administering a Software Engineering Self-Assessment Test to more than 2,500 software developers and their managers. He reported that software testing is among the most poorly understood areas among both groups. As testers, we have a lot of work to do to have our activities better understood by our colleagues. Will you help by showing that we exist?

Ironically, the demand for experienced testers has never been greater. Ask any recruiter.

David Gelperin
Software Quality Engineering
Jacksonville, Fla.
sqeqelp@aol.com

Using Explorer 3.0 a piece of cake

I am a little surprised by the difficulties your Canadian readers described about downloading and installing Microsoft Explorer 3.0, in your Aug. 19 issue ["Microsoft trips on Web; user complains over Explorer 3.0 ship"]. I downloaded the program a day or so after it was released and installed it on my machine, my wife's and my kid's, and then I put it on my machines at work. I like it a lot — no General Protection Faults, very fast, mail built in, news reader built in, and I can prevent cookies (right click, Properties, Advanced).

Brian Mahoney
Seattle

Microsoft tactics make it suspect

David Coursey, please check your facts about martial arts ["Netscape: Put up or shut up," CW, Sept. 16]. Aikido has nothing to do with the use of swords per se, either wooden or actual. Aikido is an unarmed martial art that mostly concerns itself with defending oneself against armed opponents.

Martial arts using sticks are generically called bo-jutsu. The most well-known such martial art is kendo. The wooden implement is a bo-ken — literally "wood-sword."

In any case, your partisanship for Microsoft makes your opinions suspect.

I personally wouldn't be caught, alive or dead, allowing important business functions to depend upon Microsoft products.

In the mid-1980s, General Protection Faults and Uninterruptible Application Errors of Windows 3.0 and 3.1 made it abundantly clear that only fools risk mission-critical data to Microsoft roulette. After a few scorching lessons, I went back to DOS-only applications until OS/2 stabilized at Version 2.1.

Michael G. Jones
Palm Harbor, Fla.

More letters, *page 40*

■ Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

The Newspaper of [illegible] Management

COMPUTERWORLD

Everything you need to know.

Save over 73%

☑ **Yes,** I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Single copy price: $3.00/issue *U.S. Only. Canada $95, Mexico, Central/South America $160, Europe $295, all other countries $295.

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government: State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
99. Other_____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr. Tech Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
60. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner/General Mgr.
12. Vice President, Asst. VP
13. Treasurer,Controller /Financial Officer
DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems	
(a) Solaris	(e) Mac OS
(b) Netware	(f) Windows NT
(c) OS/2	(g) Windows
(d) Unix	(h) NeXTstep
App. Development Products	☐ Yes ☐ No
Networking Products	☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1. At this location	2. Entire Organization
A. 20,000 +	☐	☐
B. 10,000 –19,999	☐	☐
C. 5,000 – 9,999	☐	☐
D. 1,000 – 4,999	☐	☐
E. 500 – 999	☐	☐
F. 100 – 499	☐	☐
G. 50 – 99	☐	☐
H. 20 – 49	☐	☐
J. 10 – 19	☐	☐
K. 1– 9	☐	☐

B4O6 Q

The Newspaper of [illegible] Management

COMPUTERWORLD

Everything you need to know.

Save over 73%

☑ **Yes,** I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Single copy price: $3.00/issue *U.S. Only. Canada $95, Mexico, Central/South America $160, Europe $295, all other countries $295.

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government: State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
99. Other_____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr. Tech Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
60. Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner/General Mgr.
12. Vice President, Asst. VP
13. Treasurer,Controller /Financial Officer
DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems	
(a) Solaris	(e) Mac OS
(b) Netware	(f) Windows NT
(c) OS/2	(g) Windows
(d) Unix	(h) NeXTstep
App. Development Products	☐ Yes ☐ No
Networking Products	☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1. At this location	2. Entire Organization
A. 20,000 +	☐	☐
B. 10,000 –19,999	☐	☐
C. 5,000 – 9,999	☐	☐
D. 1,000 – 4,999	☐	☐
E. 500 – 999	☐	☐
F. 100 – 499	☐	☐
G. 50 – 99	☐	☐
H. 20 – 49	☐	☐
J. 10 – 19	☐	☐
K. 1– 9	☐	☐

B4O6 Q

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

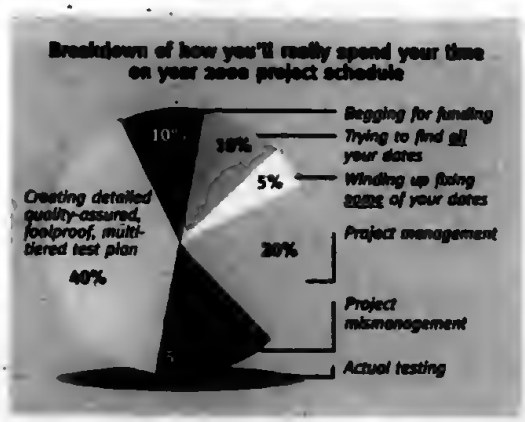
Michael Cohn

The straight dope on year 2000 projects

The year 2000 is just a project management problem – one that will squash your career.

A bunch of folks out there are struggling with the year 2000 problem. It's ugly. It's hard. But don't go it alone — you'll screw it up. Join user groups. Call in consultants. Learn as much as you possibly can — then screw it up.

What you need is this basic, yet nowhere-near-foolproof, methodology for year 2000 projects (see chart). Every womb-to-tomb millennium project must go through these six steps. If you follow this methodology, you can walk up to your CIO in 1999 and confidently say, "We're compliant and fully tested. Let's get out of here before the stuff hits the fan."



1. Inventory. You can't do anything until you tally your date-critical code. That isn't easy. Your operation might be distributed. It might be global. By the time you've got numbers for your mainframe system, desktop systems, telecommunications system and elevator system, you've probably done a number on your nervous system.

2. Assessment. Next, you have to tell the brass what impact the year 2000 project will have on your business. So conduct an assessment. It will likely show that you don't have enough people, time or money — and that's just for the oon-2000 stuff you said you'd finish *last year*.

3. Plan. Once you've cost-effectively spent hundreds of thousands of dollars on an assessment, you need to more cost-effectively spend hundreds of thousands of dollars on a plan. You need a plan that tracks modules, resources, bridges, files ... the works. The year 2000 project really isn't rocket science; it's simply s project management problem — s project management problem that will likely squash your career like s grape.

4. Code modification. It's time to start the real work. Your goal: Run head-down, 20 hours per day, for months on end, trying to handle all your dates. That will be a piece of cake compared with trying to handle all your *programmers* after two weeks of this death march.

5. Testing. Don't get hoodwinked by consultants who claim testing is 50% of the total project. If you already happen to have s bunch of extra processors, storage capacity, test beds, test scripts, test tools and test methodologies, you're probably in good shape. But if you're like the rest of us, testing can *still* help cut your year 2000 project budget in half — because you won't do any.

6. Implementation. Finally, figure out how to put the whole mess in production. Maybe all at once. Maybe one piece at s time. Maybe you can finish one piece without breaking all the other pieces. But when you reach this point, you've made it. You can stand on your desk, pound your chest and cry out: "We're finished! We're finally year 2000-compliant!" Unless by then it's 2003 — then you might want to keep the whole thing kind of quiet.

Cohn is trying to be a year 2000 project consultant in Atlanta, but he still wonders if 1996 was a leap year.

Michael Schrage

Organizational charts really do matter

Feel second-class because you report to the CFO? You're not alone.

While working the posh reception at her company's global information systems retreat, the chief information officer of a multibillion-dollar health care giant turned to me and confessed her greatest professional frustration: She reports to the chief financial officer, not the CEO.

"I think it really sends s bad signal to the organization about where IS ranks as s corporate priority," she whispered.

Maybe it does; maybe it doesn't. Maybe this is just the whine of a bruised ego, or maybe this is the voice of s savvy corporate politician who has learned the hard way what levers of power can't be reached. But there's a very serious managerial issue lurking here — one that has enormous repercussions for the future of IS governance.

Barely 15 years ago, the big debate was whether companies even needed s CIO. To this day, most organizations have trouble deciding what makes a CIO successful.

So let's take our CIO's frustration at face value and ask a simple question: What's more revealing about an organization's IS management in 1996? Is it the fact that the firm has a CIO at all, or is it whether the CIO reports to the CEO, CFO or chief operating officer?

Practically every organization of any size has a CIO. The title, if not the role, has become s commodity. What hasn't become a commodity is the way organizations choose to organize their IS activities. Some organizations choose outsourcing, others are radically decentralizing, and still others argue that recentralization via standards enforcement is the way to go.

In these scenarios, does reporting to a CEO make more of a difference than reporting to the CFO? The issue of who reports to whom — and why — will become more important over time, not less.

The reasons are straightforward: CEOs, CFOs and COOs have different views of the organization. They often have different agendas and different managerial competencies. Pecking order undeniably matters. Even if we put the volatile issue of personality aside, CIOs who perform brilliantly by CFO criteria might shine less brightly if they had to regularly interact with the CEO — and the converse holds equally true.

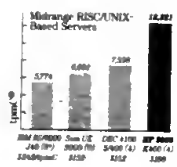
Based on anecdotal observation, I haven't a speck of doubt that CIOs who report to CFOs have to justify their technology investments using different metrics than those CIOs who report to CEOs. Does that make them any more effective? Or any less strategic? That's unclear.

No doubt, there's a terrific doctoral thesis in sociology, economics, organizational behavior or computer science to be done on the relationship between IS effectiveness, the existence of a CIO and whom that CIO reports to in the organization. There needs to be more empirical research in this area.

We all hear the blather about the "strategic importance" of IS and the need for "top management commitment." But does that necessarily mean the CIO must report to the CEO? Does it mean IS departments are second-class citizens if they're housed within finance, operations or administratioo?

My belief is that the CIO position as we know it is cost-effectively dead. The ongoing organizational restructuring of IS makes a CIO less of a strategic leader and implementer than a harried air-traffic controller. Indeed, my best guess is that most organizations will discover that decentralization and outsourcing of IS will lead to a decentralization and outsourcing of technology leadership as well. CIOs will be CIOs in name only. Will that be a good thing? Why not ask that CIO's boss?

Schrage is a research associate at the MIT Media Lab and author of *No More Teams!* His Internet address is schrage@media.mit.edu.



The results are in. Now our line of servers isn't just broader. It's also faster. HP NetServers and our new 64-bit HP 9000 Enterprise Servers cover your NT® and UNIX® needs across the enterprise and run any application you want. Higher performance, lower prices and wider range. Looks like we hit the trifecta.

Digital Prioris LX 6/166	$117	3,760
Compaq ProLiant 6000 6/166	$36	5,077

www.hp.com/go/computing

HEWLETT®
PACKARD

THERE'S ONLY ONE PROBLEM WITH BUYING
A PC DESIGNED FOR TODAY'S BUSINESS APPLICATIONS.
IT'S CALLED TOMORROW.

intel inside
PENTIUM PRO

Intel Pentium Pro Processor up to 200 MHz

16 MB or 32 MB RAM Standard

2 GB IDE or SCSI hard drive

PCI Accelerated 2D and 3D graphics

Microsoft Windows NT

3 year limited warranty

INTRODUCING THE POWERMATE PROFESSIONAL SERIES WITH PENTIUM® PRO PROCESSOR.

These days, trying to buy technology for your company is like trying to shoot a moving target. If you don't set your sights far enough ahead, you'll miss. Fortunately, the NEC PowerMate® Professional is at the leading edge of the technology curve. With advanced technologies like a 200 MHz Intel Pentium Pro processor and Microsoft Windows NT®, the PowerMate Professional is just the long-term investment your company has been looking for. Power hungry 32-bit office applications, like 3D CAD/CAM and financial modeling, are not a problem for the PowerMate Professional system. And you can maintain full compatibility with all general purpose PC applications. So if you're tired of keeping up with the latest technology, we have a solution: the latest technology. For more information on the PowerMate Professional Series and other PowerMate products, just call 1-800-NEC-INFO, or visit us on the web at http://www.nec.com.

SEE, HEAR AND FEEL THE DIFFERENCE.™

NEC

© 1996 Packard Bell NEC, Inc. NEC and PowerMate are registered trademarks of NEC Corporation. See, Hear and Feel the Difference is a registered trademark of NEC Technologies, Inc. The Intel inside logo and Pentium are registered trademarks and the Pentium Pro Processor logo are trademarks of Intel Corporation. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.
Key 699160

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____

E-Mail _____

What is the client platform for your next client/server projects? _____

What is the server platform planned for your client/server projects? _____

How many developers are there on a typical project in your organization? _____

How many end-users are there on a typical application built in your company? _____

PLEASE SEND ME A DEMO CD ON PERFORMER!!!

Texas Instruments

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 7284 DALLAS, TX

POSTAGE WILL BE PAID BY ADDRESSEE

TEXAS INSTRUMENTS
MS 8512
PO BOX 655474
DALLAS TX 75265-9863

Telcos are poised to take over 'net

The computer industry doesn't own the 'net anymore.

A recent series of seemingly minor regulatory skirmishes symbolizes the coming sea change in Internet leadership.

In the past few weeks, various long-distance and regional telephone interest groups have complained to the Federal Communications Commission that 1. Internet users are overloading their phone lines without providing adequate compensation; 2. long-distance Internet phone service should be either forbidden or regulated; and 3. Internet service providers should have to pay the same sort of access charges that long-distance carriers pay.

The merits of these claims are less important than the message they send. The telecommunications industry is tired of being merely a passive provider of bandwidth. It wants a say in how the Internet is run.

David Moschella

Carriers have a better record of building robust networks.

Not surprisingly, computer vendors have objected, sometimes shrilly. They still see the 'net as their domain. After all, the Internet uses their servers, routers and software. They might talk about the merger of computers and communications, but what they really want is a takeover. Hence the excitement over Internet telephony.

But if anyone is positioned to take over the Internet, it's the phone companies, despite a history of almost comical ineptitude in their computer endeavors. The fact remains that a tenfold increase in local loop bandwidth would do much more to move the Internet forward than any similar increases in microprocessors, disk drives or even routers. In other words, the Internet's single most important technological need is something computer vendors can't provide. This marks a fundamental turning point in the computer industry's history.

In the next two years, national phone companies will almost certainly come to dominate local Internet access and backbone transmission in most markets. Inevitably, they will experiment with tiered and usage-based pricing and perhaps even Internet service provider and international access charges.

Having gained control over delivery and pricing, it's only a small step for the phone companies to become key players in emerging areas such as real-time audio and video, advanced routing, broadcast capability, traffic management and point-to-point connections. As voice and Internet messaging come together, they even have a good shot at the big software prizes of directories, addressing, domain names, content identifiers and security.

If even half of this comes to pass, the phone companies will become equal partners in the development of the 'net. That would be a good thing. The telephone industry has a far better record for building reliable, interoperable networks than the computer industry. It has more to offer than most of the 'net community realizes.

Moschella is senior vice president of research at Computerworld, Inc. in Framingham, Mass.

get more horsepower

You can try to get a few more miles out of your stalling fat-client tool, or you can trade up into the fast lane of high-performance distributed computing with **Performer**™ from Texas Instruments Software.

Performer is the next generation "scalable department" development tool that combines the ease of visual programming with the integrity of enterprise application development tools. Under the hood is a significant new model-based technology that will dramatically impact the way you build software. Performer delivers scalable, maintainable, high-performance applications that can be implemented in distributed client/server, Internet and Open Server architectures.

Put more horsepower into your development projects. Call **1-800-619-3030 extension 9001** for a highly interactive and informative demo CD on Performer, or visit our web site at www.ti.com/software/performer.

TEXAS INSTRUMENTS

To construct something this amazing, Nature's tools were wind and water.

Fortunately, you've got all these.

Tools for every type of professional developer.

With all respect to nature, today's development jobs can be monumentally demanding. In fact, delivery dates have accelerated to what seems an almost unnatural rate. Which is why we've created the Powersoft® family of comprehensive tools. To get things done. From C++ to Java to 4GL, you've got the power to make business applications perform. Our products include such performance enhancers as ObjectCycle™ for version control, patented DataWindow™ for easy data access and Visual Components™ galleries that add incredible functionality. And Sybase® SQL Anywhere™ provides local database access to create, develop and deploy from wherever you choose. Questions or tips? Our support staff has answers for every type of developer. All so you can do some pretty amazing work yourself. As quickly and easily as humanly possible.

PowerBuilder®
Fast applications, anywhere. Power, precision and performance.
Optima++™
RAD productivity meets the power and performance of C++. Fast client/server and Internet solutions.
S-Designor®
Comprehensive modular toolset for DB modeling and object generation. Everything you need.
Watcom™ C/C++
Robust C and C++ on a multitude of platforms. Performance nothing short of brilliant.

For more about our industry-leading development tools or to place an order, call 800-395-3525. Or visit www.powersoft.com.

Powersoft.

Review disappoints

After reading the article by Garrett N. Ray on Microsoft Corp.'s Internet Explorer 3.0, I was amazed that it was awarded a B+ as tested ["Explorer gains ground," CW, Aug. 19]. I was under the impression that a C meant average, B meant above average, and a B+ meant well above average.

Does a program that has a *severe* security problem — one that could allow a Web page to manipulate data on your computer — and "multiple performance problems" rate as "well above average" for your publication?

A program that has security programs, performance problems and is "still imperfect" should rate a C at best. Even if the company is making progress toward resolving these problems, a high grade should not be awarded until the application's shortcomings have been fixed.

If this product can rate a B+, then I have pity for your readers, because *Computerworld* appears to have low rating standards. It also gives an impression of extreme bias toward Microsoft and/or Windows. I will no longer use your reviews of any product because I no longer have the expectation of objectivity and high standards from your publication.

Ian D. Stiwinski
San Jose, Calif.

Haves and have-nots. How do you bring educational opportunity into balance? Not by bringing down the haves. But by bringing technology into every one of America's schools, to every one of our students. Who can do it? Your company. And Tech Corps.

TECH CORPS

A grassroots effort to enhance teaching and learning through technology. And give all students the leverage they need to compete. Discover the rewards of becoming a Tech Corps Corporate Sponsor. 508/620-7751 • http://www.ustc.org
America needs to know.

Organizations already providing national sponsorship include Cellular Telecommunications Industry Association Foundation (CTIA), Digital Equipment Corporation, and MCI Foundation.

Privacy regulations not always respected

Your In Depth article about online snooping ["Online Snoop," CW, Aug. 12] quite adeptly pointed out the amount and nature of personal information that is available about individuals through the Internet and private investigative services. You might be surprised to learn that providing or obtaining some of that information is a criminal offense.

For example, credit information about an individual is protected under Federal Trade Commission law. Credit agencies such as TRW, Inc. and TransUnion Credit Informatioo Co. — and those who obtain that information without the consent of the individual — can be punished or sued under federal law. Certain other records created by government agencies are also protected by law from public or unauthorized access.

It is unfortunate that many investigators think they have the right to disregard these laws. Many of them are former law enforcement officers who seem to think the law does not apply to them. It's also unfortunate that our courts and criminal justice systems do not see fit to enforce these laws.

What we really oeed is an In Depth column on how to protect ourselves now that you have communicated how exposed we are.

Ray Thomas
Cleburne, Texas

The mayor's fumble

I read with particular delight the use of technology by our local government organization ["City blazes own IS trail," CW, Sept. 16]. However, it is too bad that the lady in the picture, Mayor Sam Kathryn Campana, does not appreciate the capabilities of the technology.

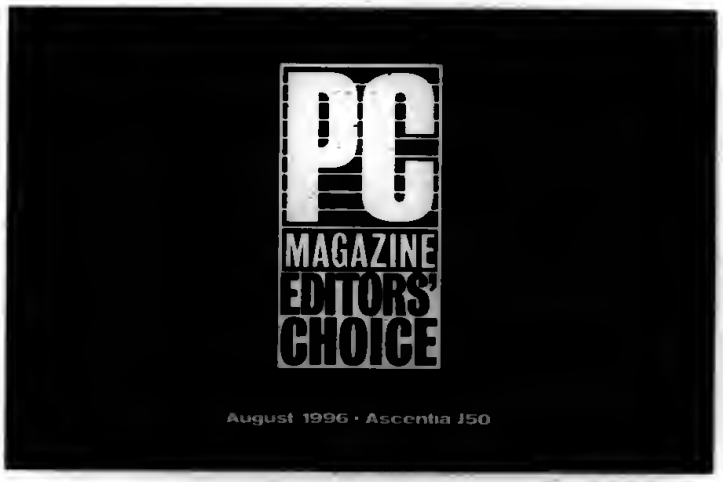
My reason for saying this revolves around the recent disclosure in the local media that she has used the 911 emergency calling system to get assistance in finding buildings in Scottsdale at least a dozen times in the past nine months.

I am not sure whether she is not capable of using this great geographical information system or that she is monumentally insensitive to what the 911 service is supposed to be. Either way, we all got a great belly laugh out of your article, especially the line about "the mayor, who taps is to the GIS...." Mayor Campana is taking a lot of heat on this subject right now.

Ron Meyers
Cave Creek, Ariz.

intel inside
pentium

We gave PC Magazine an AST Ascentia J.



What we got in return was priceless.

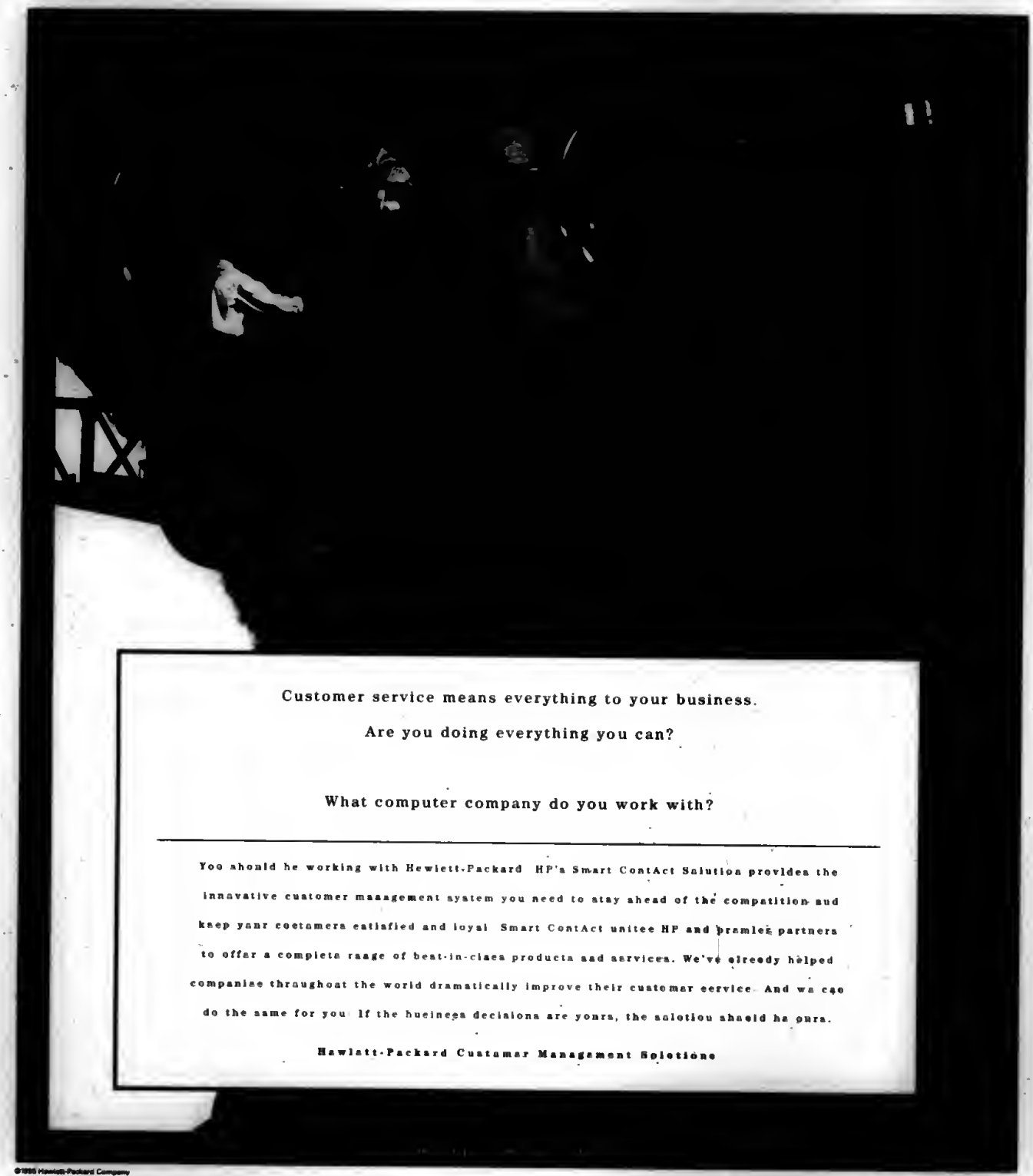
Ascentia J50 • *133MHz Pentium® processor, 10.4" SVGA TFT, 2 Type II or 1 Type III PC card slots, 800 MB removable hard drive, built-in 16-bit CD quality audio, integrated 14.4 modem, Lithium Ion battery, weight: 5.8 lbs.*

Pardon our excitement, but the AST® Ascentia™ J just beat out 20 competitors to win the coveted PC Magazine Editors' Choice™ award. And this is just one of several awards that have been bestowed upon the Ascentia J, including the PC Week Analyst's Choice award and Windows Magazine 100 best products. So why don't you see for yourself what the experts are raving about and open up an AST Ascentia J, or a PC Magazine. Both will show you just how impressive we are. Call 1-800-876-4AST or visit us at www.ast.com.

AST

Where things are HAPPENING™

**Estimated selling price based on Ascentia J50. Actual price may vary. Contact your reseller for details. ©1996 AST Research, Inc. AST is a registered trademark. AST Computer, the AST logo, Ascentia and "Where Things are Happening" are trademarks of AST Research, Inc. Intel, Pentium, and the Intel Inside logo are registered trademarks and the Pentium Processor logo is a trademark of Intel Corporation. All other products or services mentioned herein may be trademarks or registered trademarks of their respective owners. Information subject to change without notice.*



Customer service means everything to your business.

Are you doing everything you can?

What computer company do you work with?

You should be working with Hewlett-Packard. HP's Smart ContAct Solution provides the innovative customer management system you need to stay ahead of the competition and keep your customers satisfied and loyal. Smart ContAct unites HP and premier partners to offer a complete range of best-in-class products and services. We've already helped companies throughout the world dramatically improve their customer service. And we can do the same for you. If the business decisions are yours, the solution should be ours.

Hewlett-Packard Customer Management Solutions

©1998 Hewlett-Packard Company

HEWLETT® PACKARD

Snapshot eases backup

By Michael Goldberg

Mainframe users say Snapshot Copy, a new IBM storage feature, could quicken their batch processing and application testing. The product creates a virtual copy of data without requiring more disk capacity.

The technology is similar to copying the index of a book so you can locate important points without having to duplicate the entire tome.

The feature is available on IBM's Ramac Virtual Array, which was formerly sold by Storage Technology Corp. as the Iceberg subsystem. IBM has resold Iceberg and other StorageTek disk arrays (see chart) since July. Snapshot Copy also is available to Iceberg users.

Iceberg and Virtual Array use a log-structured file system to keep track of data stored on disk. Snapshot copies a set of pointers that indicate where data is located on disk; users then have two reference lists for the same data.

This replaces the usual process of making a backup copy of data or creating a subset of the data to

Snapshot, *page 49*

Iceberg	Ramac Virtual Array
Kodiak	Ramac Scalable Array
Arctic Fox	Ramac Electronic Array

Brief

DG expands server family

Data General Corp. has expanded its Avion server line with the introduction of a quad-processor server based on Intel Corp.'s high-end 200-MHz Pentium Pro chip. Pricing for the AV 3600 will start at about $12,000. AV 3600 will support up to 4G bytes of memory, 15 I/O slots and several operating systems, including Windows NT and DG Unix. The systems currently are shipping.

Sun shines on clusters

Targets high-end Unix market

By Jaikumar Vijayan

Sun Microsystems, Inc. is putting more weight behind its recent push in to the high-end commercial Unix server market with clustering.

The company last week bolstered its server offerings with the introduction of Ultra Enterprise Cluster technology that will let users tie two Sun servers in a high-availability configuration. If one server crashes, the other automatically backs up and controls all applications on the failed server.

Using Sun's clustering technology, corporations can tie together two 30-processor Sun servers, with one acting as a backup to the other.

Performance boost

The technique significantly enhances systems availability and reliability — crucial factors for corporations that want to run large, critical applications on servers.

This kind of fail-over clustering capability has been available for years from vendors such as IBM and Digital Equipment Corp., but it hadn't previously been available from Sun.

The highlight of Sun's announcement is the service-level guarantees the company is building into its cluster offerings.

- Scales from Ultra Enterprise 2 workgroup clusters to high-end Ultra Enterprise 6000 clusters
- Supports up to two 30-processor Ultra Enterprise 6000 systems
- Has application-specific fail-over scripts

Sun will offer an Ultra Enterprise Cluster Support Services Package from SunService that includes installation, consulting services, operator training and support.

As part of the offering, customers can buy a systems-availability contract that guarantees system uptime.

Other vendors, including NCR Corp. and IBM, offer similar application- and customer-specific availability guarantees.

"This kind of a guarantee makes a positive statement about Sun's willingness to stand behind its technology," said Jay Bretzmann, an analyst at International Data Corp. in Framingham, Mass.

"We will be watching Sun's [clustering] product evolution very closely," said Pompi Malik, MIS manager at Brewers Retail, Inc., a large beer retailer in Mississauga, Ontario.

High-end clustering

The company doesn't expect to need high-availability clustering technology for at least another year or so, Malik said. Before Sun's announcement, the corporation had considered third-party clustering technology to eventually tie its Sun servers together.

"So far, the technology has been too expensive for us, but we are eventually going to find the need for the kind of high-speed data recovery" that Sun's clustering products will offer, he said.

Sun will offer the new cluster-

Sun, *page 45*

SUDDENLY, EUROPEAN STANDARDS ARE A GORGEOUS NECESSITY.

If your require a 17" monitor for your media-intensive applications, don't just settle for a bigger system. Acquire a better one. A media-ready Nokia 447X.

These are the first monitors in the world to achieve the new VESA standards for display clarity. Their spacious 15.7" viewing area boasts an aperture grill of .25 mm and refresh rates of 150 Hz. They are capable of 1600 x 1200 resolution, which translates directly to improved working conditions and user-sensitivity. They are also the first to be TCO-95 certified for greatly reduced screen emissions.

What's more, dual-powered stereo speakers in front combine with a subwoofer in the swivel/tilt base to project audio that is properly shaped and sensational. Combined with its standard in-bezel microphone, the media-ready series enables a complete convergence of computing and communications, which makes the new 447X series a necessity for anyone making full use of their computer.

To meet today's standards, work with the people who set them.

Visit us at www.nokia-americas.com or call 1.800.BY NOKIA and ask for Dept. N212.

447X—High-resolution display ideal for graphics-intensive applications

447Xm—Professional-caliber display with integrated speakers, sub-woofer, and microphone

447Xmc—Adds to X series features with built-in color video camera

NOKIA

"Nokia and authorized reseller. Some of NOK Business Solutions. Actual viewing area slightly less. Manufactured and designed in Finland by NOK [illegible]. Nokia and NOKIA are trademarks of Nokia Group Products, Inc. ©Intel Corporation 1996. Prices and availability are subject to change without notice. To keep the earth free of radioactive [illegible] of the nuclear variety.

Servers PCs

Snapshot eases backup

By Michael Goldberg

Mainframe users say Snapshot Copy, a new IBM storage feature, could quicken their batch processing and application testing. The product creates a virtual copy of data without requiring more disk capacity.

The technology is similar to copying the index of a book so you can locate important points without having to duplicate the entire tome.

The feature is available on IBM's Ramac Virtual Array, which was formerly sold by Storage Technology Corp. as the Iceberg subsystem. IBM has resold Iceberg and other StorageTek disk arrays (see chart) since July. Snapshot Copy also is available in Iceberg users.

Iceberg and Virtual Array use a log-structured file system to keep track of data stored on disk. Snapshot copies a set of pointers that indicate where data is located on disk, users then have two reference lists for the same data.

This replaces the usual process of making a backup copy of data or creating a subset of the data in

Snapshot, *page 49*

Iceberg	Ramac Virtual Array
Kodiak	Ramac Scalable Array
Arctic Fox	Ramac Electronic Array

Brief

DG expands server family

Data General Corp. has expanded its Aviion server line with the introduction of a quad-processor server based on Intel Corp.'s high-end 200-MHz Pentium Pro chip. Pricing for the AV 3600 will start at about $12,000. AV 3600 will support up to 4G bytes of memory, 15 I/O slots and several operating systems, including Windows NT and DG Unix. The systems currently are shipping.

Sun shines on clusters

Targets high-end Unix market

By Jaikumar Vijayan

Sun Microsystems, Inc. is putting more weight behind its recent push in to the high-end commercial Unix server market with clustering.

The company last week bolstered its server offerings with the introduction of Ultra Enterprise Cluster technology that will let users tie two Sun servers in a high-availability configuration. If one server crashes, the other automatically backs up and controls all applications on the failed server.

Using Sun's clustering technology, corporations can tie together two 30-processor Sun servers, with one acting as a backup to the other.

Performance boost

The technique significantly enhances systems availability and reliability — crucial factors for corporations that want to run large, critical applications on servers.

This kind of fail-over clustering capability has been available for years from vendors such as IBM and Digital Equipment Corp., but it hadn't previously been available from Sun.

The highlight of Sun's announcement is the service-level guarantees the company is building into its cluster offerings.

- Scales from Ultra Enterprise 2 workgroup clusters to high-end Ultra Enterprise 6000 clusters
- Supports up to two 30-processor Ultra Enterprise 6000 systems
- Has application-specific fail-over scripts

Sun will offer an Ultra Enterprise Cluster Support Services Package from SunService that includes installation, consulting services, operator training and support.

As part of the offering, customers can buy a systems-availability contract that guarantees system uptime.

Other vendors, including NCR Corp. and IBM, offer similar application- and customer-specific availability guarantees.

"This kind of a guarantee makes a positive statement about Sun's willingness to stand behind its technology," said Jay Bretzmann, an analyst at International Data Corp. in Framingham, Mass.

"We will be watching Sun's [clustering] product evolution very closely," said Pompi Malik, MIS manager at Brewers Retail, Inc., a large beer retailer in Mississauga, Ontario.

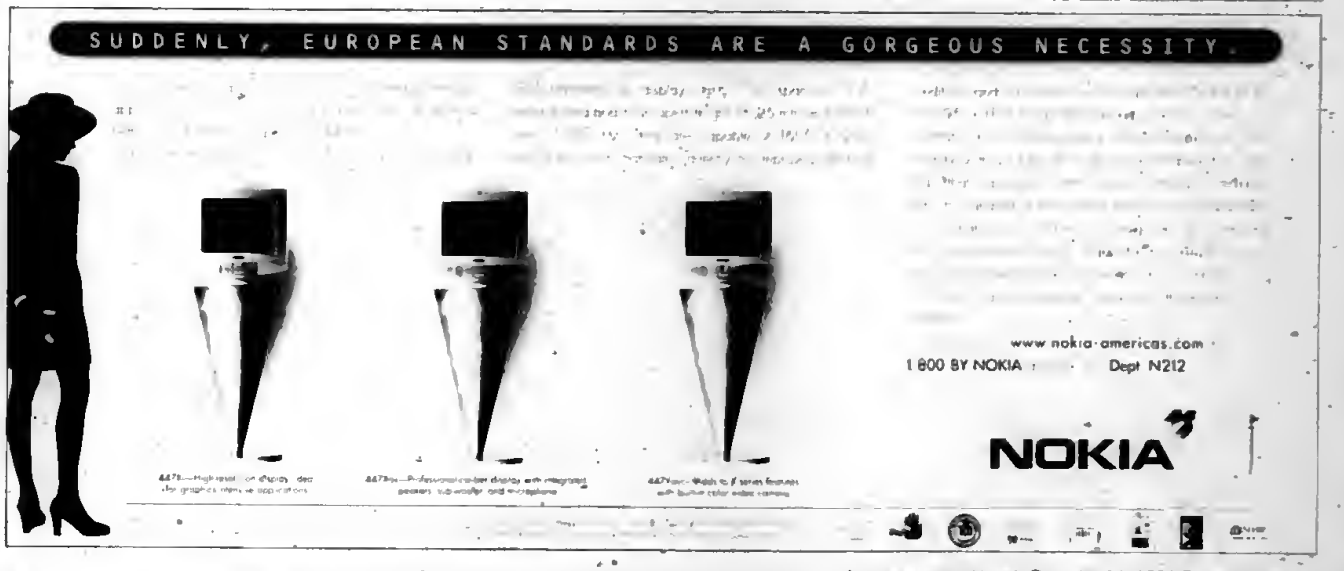
High-end clustering

The company doesn't expect to need high-availability clustering technology for at least another year or so, Malik said. Before Sun's announcement, the corporation had considered third-party clustering technology to eventually tie its Sun servers together.

"So far, the technology has been too expensive for us, but we are eventually going to find the need for the kind of high-speed data recovery" that Sun's clustering products will offer, he said.

Sun will offer the new cluster-

Sun, *page 45*



Most companies **spend** very little **time** on information storage.

So they **spend** a **fortune** on it instead.

Perhaps you should call the Teris Consulting Group.

Chances are your company is needlessly paying a price for the way it stores and manages data. So why not call Teris? As a division of StorageTek,® Teris™ has assembled some of the industry's best minds in the fields of storage, security and network management. They can help you reconfigure data centers, create an intranet or develop a master plan for storing all your data. They'll find ways to optimize your existing technology and deliver measurable results. For more information, just call **1 800 922-3260, ext. 1404.** Or visit our Web site.

Sun announces clustering for Unix servers

CONTINUED FROM PAGE 43

ing technology across its entire server line, ranging from Ultra Enterprise 2 workgroup clusters to the high-end Ultra Enterprise 6000 clusters.

Sun's clustering technology is built around a commonly available interconnect called Scalable Cluster Interface from Dolphin Interconnect Solutions, Inc. The interconnect allows two systems to be tied together in a high-availability configuration. It will also let users scale their systems beyond two nodes as their application needs grow.

"With Sun positioning itself as a commercial enterprise server vendor competing with IBM and HP, they have to make sure to have the same kind of robustness and reliability" that other vendors offer, said Jean S. Bozman, an analyst at International Data Corp. in Mountain View, Calif.

"This is something that just needs to be available to users who are going to put their business-critical applications" on these servers, she said.

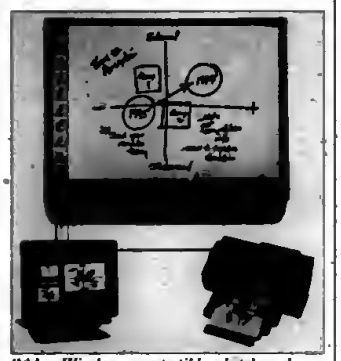
New Products

MicroTouch Systems, Inc. has announced Ibid, a computerized whiteboard.

According to the Tewksbury, Mass., company, Ibid offers the visual communication abilities of a whiteboard for showing colored diagrams and text. Users save the results in PC memory and incorporate them in most Windows-based applications, including electronic mail.

Ibid costs $499.

▶ *MicroTouch Systems*
(508) 659-9000
www.microtouch.com



Ibid, *a Windows-compatible whiteboard from MicroTouch Systems*

P. I. Engineering has announced Y-See-Two Video Signal Splitter. The product automatically splits and boosts a computer's video signal and allows the simultaneous use of two monitors.

According to the Williamston, Mich., company, the splitter is a Y-shaped device that receives power for its amplifiers from the keyboard port. It requires no external power supply. It costs $79.95.

▶ *P.I. Engineering*
(517) 655-5523
www.sojourn.com

HIRING IN 97?
MAKE IT KNOWN!
ADVERTISE IN COMPUTERWORLD'S 1997 CAREERS FORECAST & OUTLOOK
1997 FORECAST ISSUE: JANUARY 2
DEADLINE: DECEMBER 16

COMPUTERWORLD
CUSTOM PUBLICATIONS

The Computerworld Custom Publications Program

Your Technology Solution Showcase

"Computerworld's Custom Publications Program helped Hewlett-Packard reach a broad range of new customers with a comprehensive message."

"When it came time to decide what vehicle we should use to get our message across to customers, we had a number of critical requirements. We wanted the piece to convey the strength and completeness of our solution for IT organizations. In addition, it needed to highlight the experience and success of our customers and present a comprehensive point of view Computerworld's Custom Publications Program helped us fulfill these requirements, and more.

The transition our customers are making is dependent on the smooth integration of client/server hardware, relational database, operating software, applications, and other software tools. This publication allowed us to include information about the products and services offered by our strategic open systems partners — thereby providing customers with an integrated view of the complete solution.

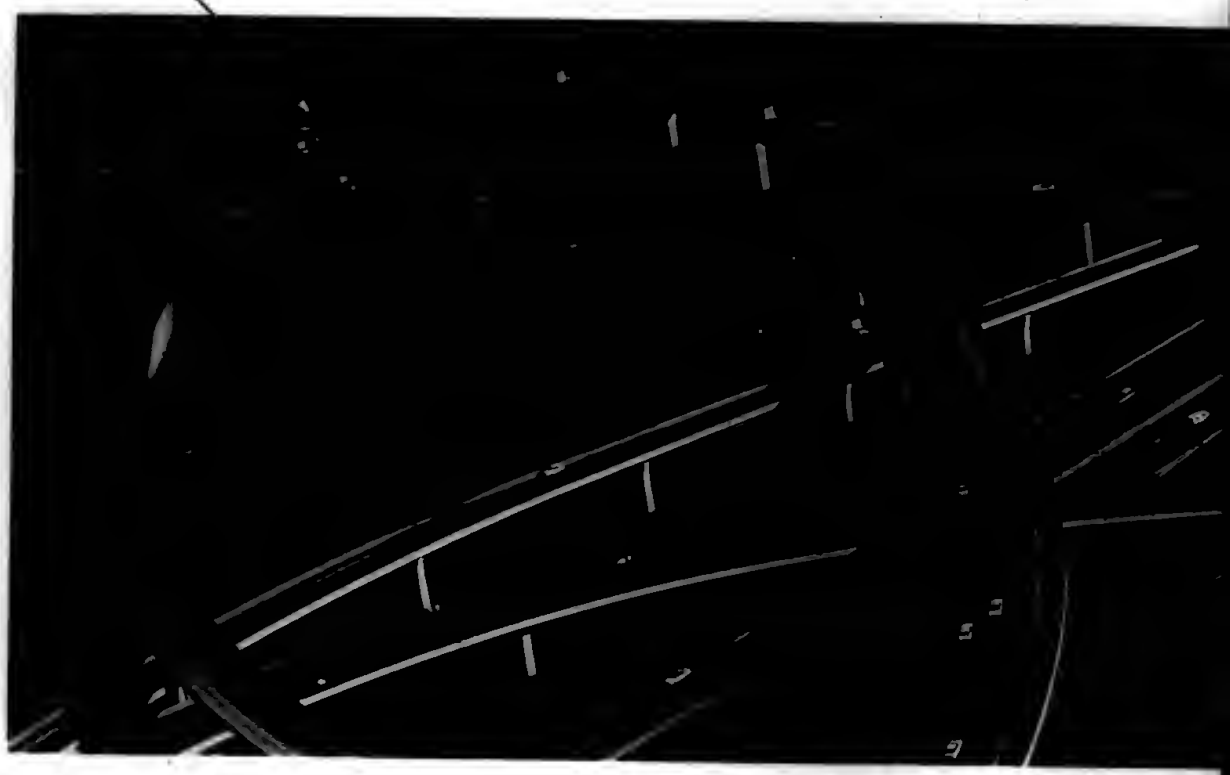
Once completed, the piece was placed in three computer industry journals. And our sales force is now equipped with a valuable marketing tool.

The bottom line is that it works. Our survey results show that custom publication readers more readily recall Hewlett-Packard as a provider of flexible, enterprise-wide computing solutions. That's why Computerworld's Custom Publications Program has become a key part of our marketing strategy."

Lora O'Haver
Solutions Marketing Manager
Hewlett-Packard Company

For more information, please contact Carolyn Medeiros, Publishing Services Director, Boston 1-800-343-6474

Now We Have A Way To Get You From Here



You are here. Your network is sprouting up like an out-of-control weed here, here, here and here. And it's probably not going to stop growing any time soon. Clearly, what's needed here is a solution that can keep pace with your expanding enterprise.

This is the Compaq Netelligent 8500 Communications Platform. (But you can just ask for our new router.)

Compaq Netelligent is our complete line of networking products. And like all great products, ours started with great companies. By making Thomas-Conrad and Networth part of Compaq, we're able to combine their industry-leading products with our networked computer experience. And provide you with high-quality, highly reliable solutions for your network.

© 1996 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. Netelligent is a registered trademark of Compaq Computer Corporation. © 1996 Cisco Systems, Inc. All rights reserved. Cisco is a registered trademark and CiscoIOS Technologies is a trademark of Cisco Systems, Inc. For more information on our full line of Compaq Netelligent products, call us at 1 800-544-5255. In Canada, we can be reached at 1 800-567-1616.

Cisco IOS. TECHNOLOGIES

To Here.

Solutions like our new Netelligent routers. Based on CiscoIOS™ software, and developed in partnership with Cisco Systems, our routers are not only highly scalable, they're highly affordable. (Just right for your expanding network.) And as it grows, we think you'll appreciate features like multiple expansion slots and a uniquely designed service tray that helps reduce maintenance costs. And because they're based on open standards, our routers are easy to integrate into your existing system.

Of course, as good as they are, Netelligent routers are just one part of our complete line of networking products. To find out more about Compaq Netelligent, visit our Web site at www.compaq.com.

A network that runs like clockwork? Who says you can't get there from here? Certainly not us.

COMPAQ

Has It Changed Your Life Yet?

THE 1996 MICROGRAFX CHILI FOR CHILDREN COOK-OFF

TUESOAY, NOVEMBER 19, 1996 • 6 PM – 11 PM • THOMAS & MACK CENTER (UNLV)

Let yourself go at this year's Micrografx Chili for Children Cook-Off—COMDEX/Fall's premiere charity event.

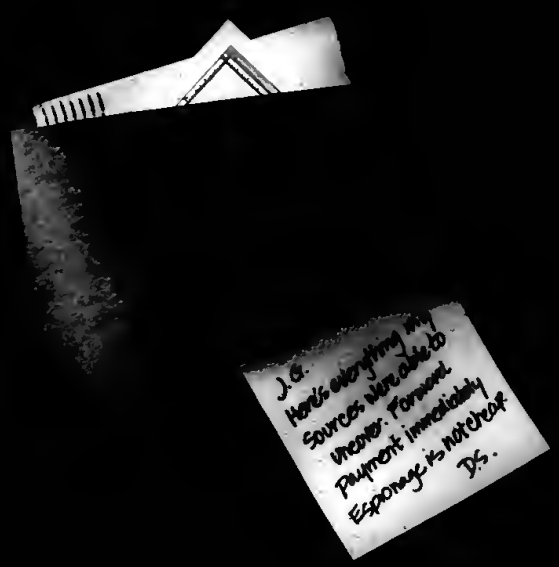
It's a zesty mix of fun, fun, fun—with chili judging and armadillo races, all topped off with a sizzling concert by **BTO** and **VILLAGE PEOPLE.**

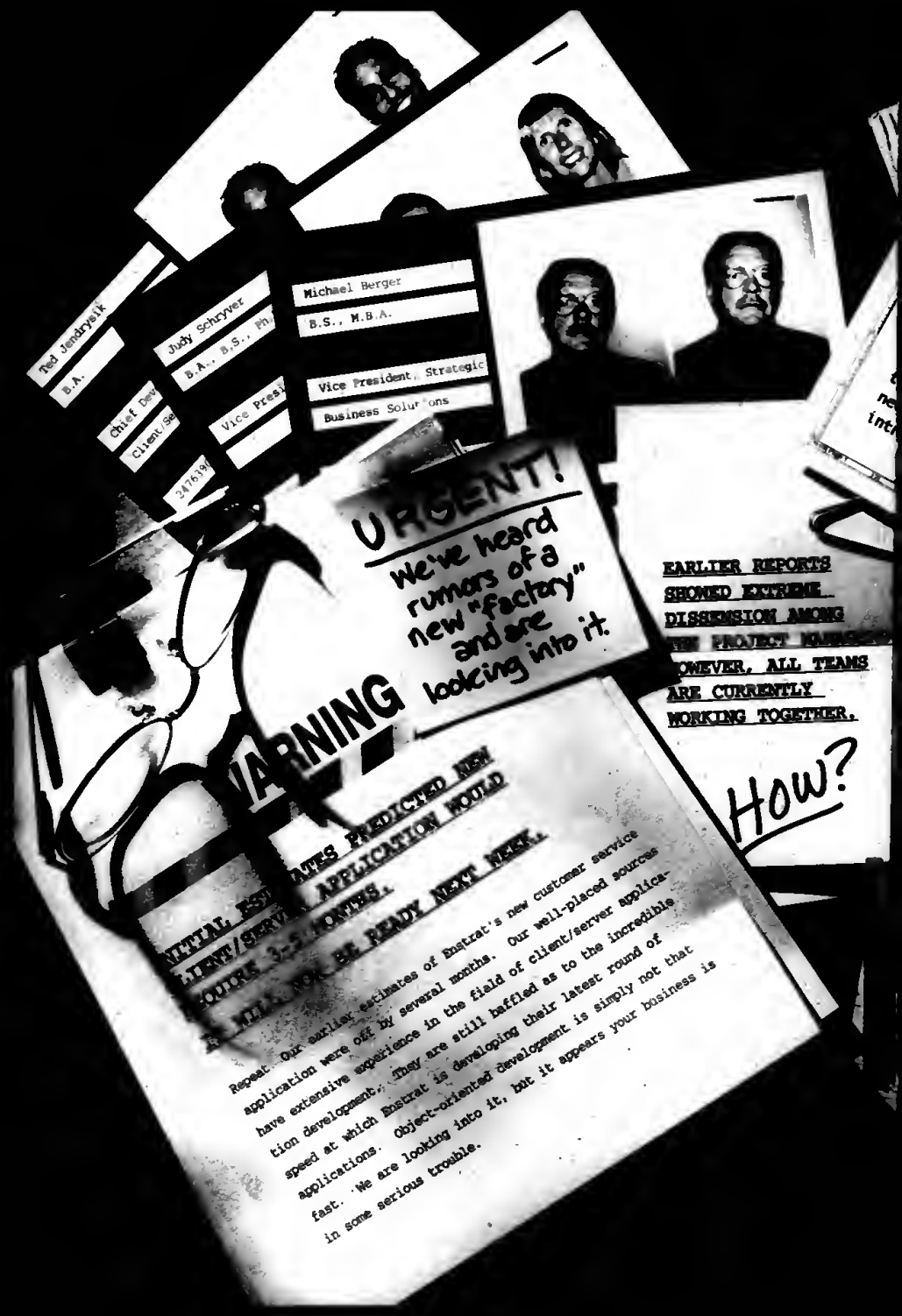
Your ticket to the Chili Cook-Off and concert is only $50—or $25 for the concert alone. And most important, it all goes to support the vital work of the National Center for Missing and Exploited Children (NCMEC).

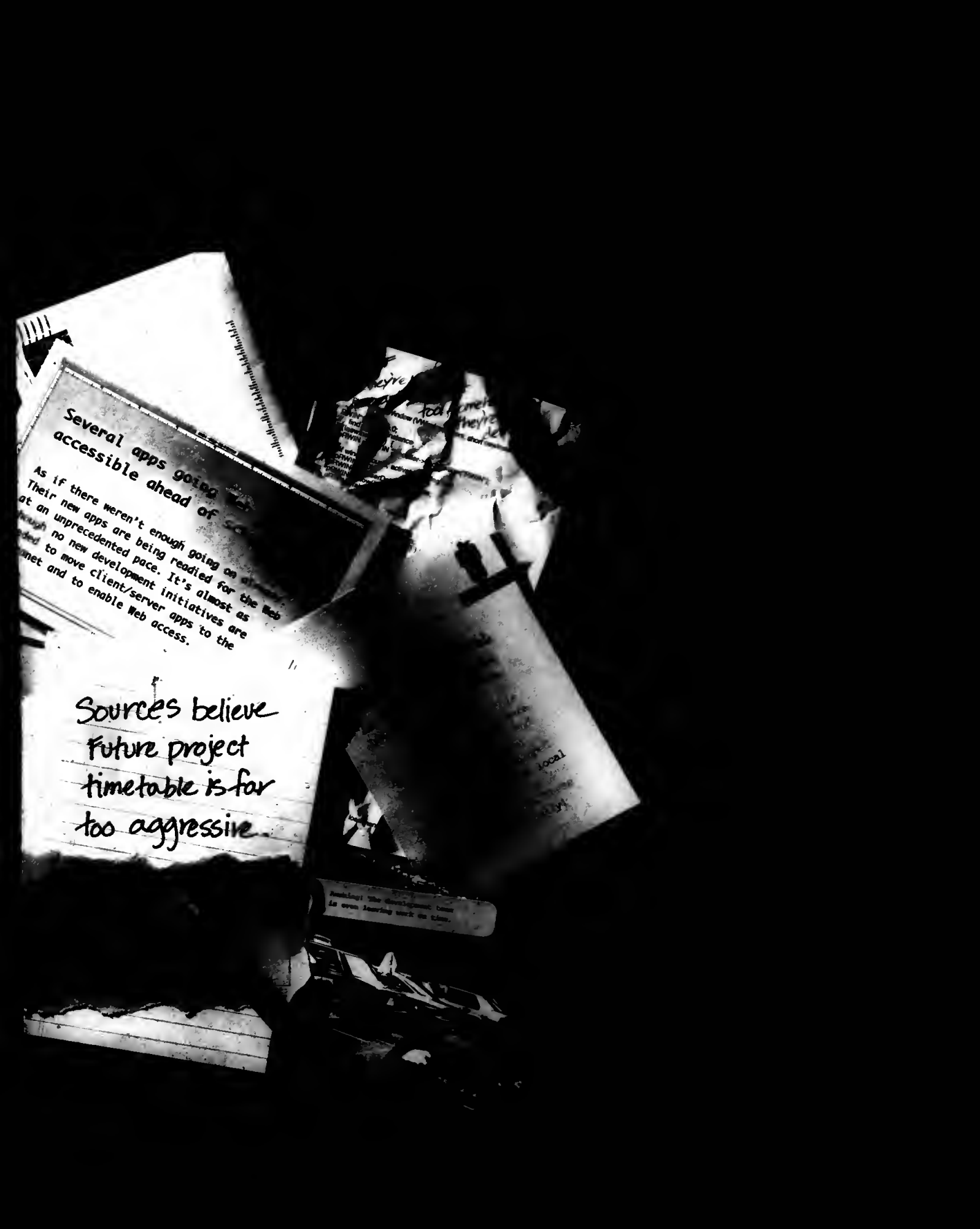
For ticket information, call the Chili Hot Line today at 1-800-357-7255. Or visit our red-hot Chili Web Page at http://www.micrografx.com/chili.html or drop into the Micrografx Chili for Children Booths at LVCC and Sands Expo Lobby at COMDEX/Fall. What's more, mention this ad and you'll get $5 off the concert admission only.

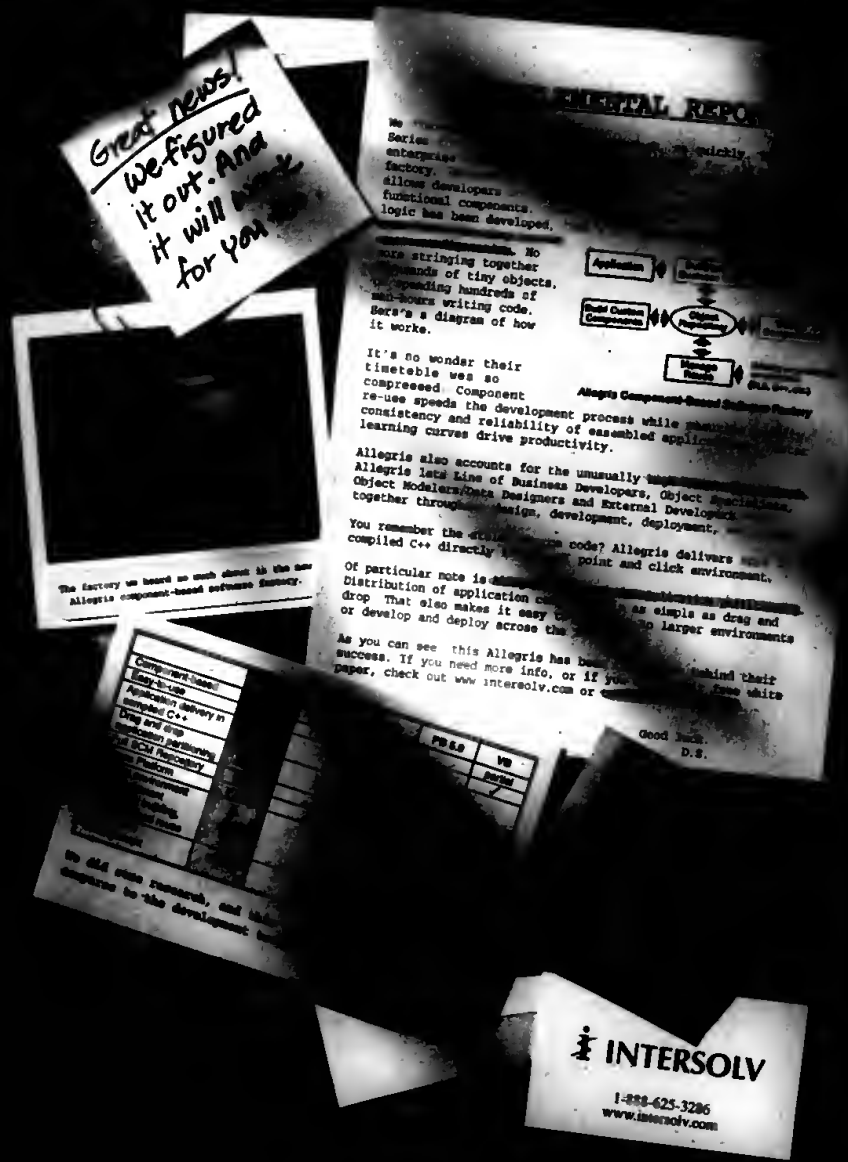
So come on out and dance the night away. You'll have a great time, and you'll help us all go a long way towards helping missing children.

1996 CATTLE BARON SPONSORS


J.G.
Here's everything on
sources we talked
about. Forward
Payment immediately
Espionage is not cheap
D.S.


Ted Jendrysik
B.A.
Judy Schryver
B.A., B.S., Ph
Michael Berger
B.S., M.B.A.
Vice President, Strategic
Business Solutions
URGENT!
We've heard rumors of a new "factory" and are looking into it.
EARLIER REPORTS SHOWED EXTREME DISSENSION AMONG
HOWEVER, ALL TEAMS ARE CURRENTLY WORKING TOGETHER.
How?
Repeat. Our earlier estimates of Enstrat's new customer service application were off by several months. Our well-placed sources have extensive experience in the field of client/server application development, they are still baffled as to the incredible speed at which Enstrat is developing their latest round of applications. Object-oriented development is simply not that fast. We are looking into it, but it appears your business is in some serious trouble.


Several apps going
accessible ahead of
As if there weren't enough going on
Their new apps are being readied for the Web
at an unprecedented pace. It's almost as
no new development initiatives are
to move client/server apps to the
net and to enable Web access.
Sources believe
future project
timetable is far
too aggressive.

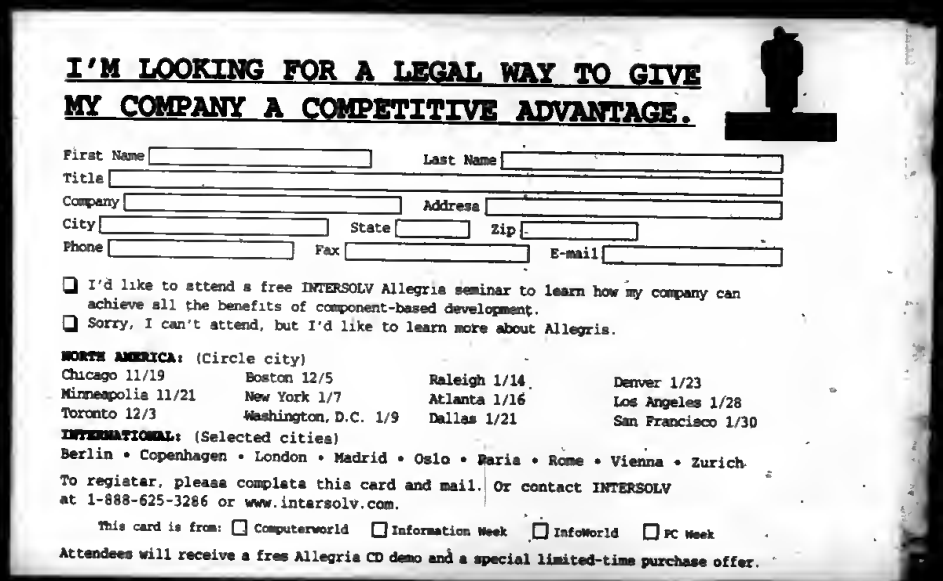

Great news!
We figured it out. And it will
for you
Application
Object Repository
Manager Roots
Allegris Component-Based Software Factory
Good luck.
D.S.
INTERSOLV
1-888-625-3286
www.intersolv.com

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 423 GAITHERSBURG MD

POSTAGE WILL BE PAID BY ADDRESSEE

ATTENTION: ALLEGRIS
INTERSOLV
9125 ARBUCKLE DRIVE
GAITHERSBURG MD 20877-9853



I'M LOOKING FOR A LEGAL WAY TO GIVE MY COMPANY A COMPETITIVE ADVANTAGE.

First Name _____ Last Name _____

Title _____

Company _____ Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____ E-mail _____

☐ I'd like to attend a free INTERSOLV Allegris seminar to learn how my company can achieve all the benefits of component-based development.

☐ Sorry, I can't attend, but I'd like to learn more about Allegris.

NORTH AMERICA: (Circle city)

Chicago 11/19	Boston 12/5	Raleigh 1/14	Denver 1/23
Minneapolis 11/21	New York 1/7	Atlanta 1/16	Los Angeles 1/28
Toronto 12/3	Washington, D.C. 1/9	Dallas 1/21	San Francisco 1/30

INTERNATIONAL: (Selected cities)

Berlin • Copenhagen • London • Madrid • Oslo • Paris • Rome • Vienna • Zurich

To register, please complete this card and mail. Or contact INTERSOLV at 1-888-625-3286 or www.intersolv.com.

This card is from: ☐ Computerworld ☐ Information Week ☐ InfoWorld ☐ PC Week

Attendees will receive a free Allegris CD demo and a special limited-time purchase offer.

Snapshot eases backup process

CONTINUED FROM PAGE 43

use in testing new applications or other functions. Users can save money by using less disk space. And creating a second set of pointers takes less time than replicating a database, observers said.

One drawback to Snapshot is its lack of support for VSAM files, a file type widely used by System/390 shops in legacy applications.

An IBM spokesman said the company expects Snapshot to support VSAM files by the middle of next year.

"The value is the prospect of being able to instantly copy a volume or a data set," said Kenneth Grant, manager of storage management at Kaiser Permanente Health Plan, Inc. in Pasadena, Calif., a user of Iceberg systems.

Grant said Kaiser Permanente has tested Snapshot on a limited basis, but he is waiting for VSAM support before fully implementing it.

With VSAM support, Grant said, Snapshot would make it easier to process hospital patients on Sundays, when computer systems are down for four hours for database backups. Using Snapshot would reduce downtime to a few minutes and allow staff to process patients when they arrive instead of completing paperwork later, he said.

Another Snapshot beta tester, Richard Fernandez, assistant vice president of computing services at Insurance Services Offices, Inc. in Pearl River, N.Y., said the technology also would improve testing of new applications because developers can access their own copy of an entire database quickly.

"Snapshot allows you to make an instant copy of your production files without stopping your workflow. You can make that [data] available immediately. You've gained some time," Fernandez said.

Briefs

Sharp hits WideNote

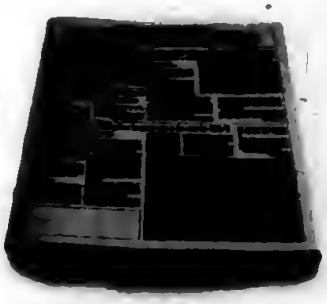
Sharp Electronics Corp. in Mahwah, N.J., has released WideNote, a wide-screen format notebook computer. The notebook weighs 4.6 pounds and has a 133-MHz Intel Corp. Pentium processor, 1.1G bytes of RAM, slots for two Type II PC Cards or one Type III [illegible] and a battery. The notebook line will range in price from $2,850 to $3,499.

IBM shows it...

IBM is shipping $200 million worth of its storage subsystems to improve the production of magnetic read/write recording [illegible] IBM, which uses the [illegible] in its own hard drives, expects to sell IBM heads to OEMs by the end of next year. An MR head is a recording device the size of a pinhead that can fit more data in a disk drive and is less expensive to make than standard thin-film heads.

... and clusters it

IBM this fall will introduce Unix clustering software that quadruples the number of RS/6000 systems that can be tied together. The company supports eight-node clusters with its current clustering product, HA/CMP. The new technology, code-named Phoenix, will handle up to 32 systems initially and expand to 128 next year, according to IBM officials. Phoenix will ship on IBM's RS/6000 SP parallel processors this year and is expected to be available on general-purpose RS/6000s by the first quarter next year.



IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld.*

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PC's, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

That's why over 145,000 IS professionals pay to subscribe to *Computerworld.* Shouldn't you?

IT'S WHAT YOU READ.

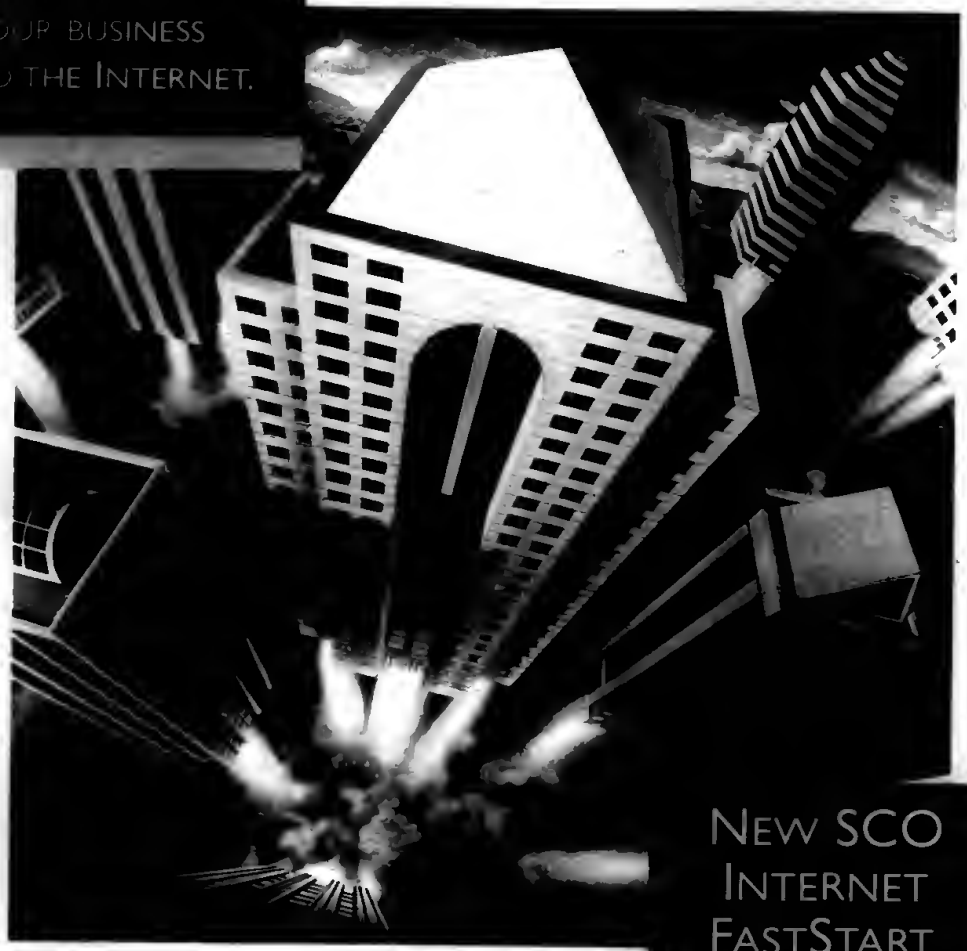
Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, *The Premier 100,* an annual profile of the leading companies using information systems technology.

Call us toll-free at **1-800-343-6474**, or visit us on the World Wide Web at http://www.computerworld.com. To order by mail, use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld.*

Then you can spend less time reading about the world of information systems. And more time conquering it.

COMPUTERWORLD
Everything you need to know.

THE MOST AFFORDABLE WAY TO LAUNCH YOUR BUSINESS ONTO THE INTERNET.



NEW SCO INTERNET FASTSTART. $995.

THE WORLD'S MOST AFFORDABLE BUSINESS CRITICAL INTERNET SERVER.

Without SCO® Internet FastStart, deploying Internet access across your enterprise is extremely expensive. FastStart gives you the power and reliability of a UNIX® system at a very low cost. And because it can be deployed on inexpensive Intel® processor-based servers, your hardware costs are lower, too.

FastStart lets you access, publish and conduct business on the Internet. And to share internal information via Intranets. But it doesn't take a rocket scientist to install and maintain.

SCO Internet FastStart Includes:

- **SCO OpenServer™ Enterprise**
- **Netscape Communications Server™**
- **Netscape Navigator™ 2.0**
- **Multi-line PPP and Multi-homing support**
- **Graphic Installation and Configuration Tool**

Don't risk grounding your business with a more expensive, less reliable server solution. Call SCO today.

SCO

1-888-SCO-4YOU
code IFQ396
www.sco.com/ad/IFQ396

SCO, The Santa Cruz Operation, the SCO logo and SCO OpenServer are trademarks or registered trademarks of The Santa Cruz Operation, Inc. in the USA and other countries. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited. Netscape, Netscape Communications Server, and Netscape Navigator are trademarks of Netscape Communications Corporation. All other brand and product names are or may be trademarks of, and are used to identify products or services of, their respective owners. The Santa Cruz Operation, Inc. reserves the right to change or modify any of the product or service specifications or features described herein without notice. The summary is for information only. SCO makes no express or implied representations or warranties in this summary. ©1996 The Santa Cruz Operation, Inc. All Rights Reserved.

Software

Users may not dance to the Castanet software distribution rhythm, 60

Java hits Wall Street

By Sharon Gaudin

Financial giants on Wall Street are stepping up to the counter and ordering a cup of Java.

The Java development language, fueled by the growing fervor over the Internet, has picked up speed and mind share in various industries in the past year.

But the financial district has an especially early and firm grip on the language, which is so new that it is still in Version 1.0 release and remains largely untested.

"We have talked with every large financial institution in New York and all of the Northeast about Java. Every single one is turning toward Java," said Stephen Siegel, Ph.D., managing director of U.S. operations at Fusion Systems Group, Inc. Fusion is a New York-based computer consulting firm for financial companies.

"Financial institutions are early adopters, so that removes any new technology barriers for them. And Java speaks to the pains they've been having in terms of cross-compatibility, the Internet and software distribution," Siegel says.

Java, Sun Microsystems, Inc.'s cross-platform development language that is largely used for Internet applications, has been catching on. But many companies are delaying deployment of Java applications until the language has a few more miles under its belt.

There are some concerns about security with Java, but most surround hostile applets that users download from the Internet into a business' system. The financial firms turning to Java are dodging security concerns by building applications in-house.

Visual development tools such as Symantec Corp.'s Visual Cafe are just hitting the market, and the shelves of Java libraries still are fairly empty.

Just the place

But that doesn't seem to be slowing the Java ramp-up at Lombard Brokerage, Inc., a discount brokerage in San Francisco.

"The financial industry is the perfect industry for the Internet," said John MacIlwaine, president and CEO of Bay One Technologies, a division of Lombard Brokerage. "It's real-time, it's graphical, and you can download charts and spreadsheets. And Java only enhances that relationship."

MacIlwaine said Lombard is starting fairly slowly, first converting some C++ programs to Java. Lombard uses servers that run SunSoft, Inc.'s Solaris operating system.

He said the company is building an order-entry application to replace a process in which traders punch information into a mainframe terminal and handle their own calculations.

"Now a broker hits buttons and calcu-

Wall Street, *page 60*

Document management group extends standards

By April Jacobs

ODMA extensions

- Stronger interoperability between desktop applications and document management systems

In a move users are likely to welcome, the Open Document Management API Forum (ODMA) has expanded its application programming interface (API) standard to allow single queries across multiple repositories.

The extensions, a set of 23 APIs, let developers give users access to document management repositories in multivendor environments. That, in turn, should help businesses that have mixed document management environments save time by easing the exchange of information among repositories.

Carl Frappaolo, vice president of Delphi Consulting Group, Inc. in Boston, said the move pushes the ODMA's standard to a higher level of functionality.

"This is very important because it's something users have been asking for for many years," Frappaolo said. "If I need to locate information [and] I don't necessarily know where it is, I don't want to have to log in to every [repository] collection to find it."

Ruby Bishop, manager of documentation and publishing in the regulatory affairs depart-

Documents, *page 54*

Oracle network vision cloudy

By Craig Stedman

Oracle Corp. this month has been giving select customers a glimpse into its network computing crystal ball.

But its product vision remains mostly cloudy, say several users who received advance briefings from Oracle about its Network Computing Architecture (NCA).

As a result, even loyal Oracle shops are finding it hard to tell whether the promised NCA will meet their need for a simpler method of connecting clients to distributed servers.

NCA, which was announced two weeks ago, is a cross-platform network infrastructure built on the Object Management Group's Common Object Request Broker Architecture (CORBA) technology for routing objects across networks. Like other CORBA backers such as IBM, Oracle wants to provide an object bus that lets customers quickly deploy applications and then rely on the underlying technology to connect end users to data.

The object-based concept holds great interest as a potential way to cut down on the mishmash of middleware users have to deal with today. But Oracle has to prove there is really something behind its marketing presentation

Oracle's vision, *page 54*

Short-term outlook

Oracle plans to ship the following NCA-compliant products and features in the next six months

November

- NetSolutions tools for Web-enabling existing applications

December

- Oracle WebServer 3.0 with support for distributed transactions
- Ability to call WebServer plug-in cartridges from Oracle 7.3.3

Q1 1997

- Oracle WebServer 3.1 with object request broker, IIOP/DCOM bridge

Q2 1997

- WebServer cartridge that supports Developer/2000 reports and forms
- Sedona Object Manager tools for developing distributed cartridges

TO STOP [illegible]
POTENTIAL AND START
YOUR COMPANY S.

[illegible] W[illegible] [illegible] [illegible] [

Code-free applications are Magic

By Garrett N. Ray

Since its inceptioo more than five years ago, Magic Software Enterprises, Inc.'s Magic database development environment has delivered a simple if unique proposition: code-free applications.

Magic 7, now available, doesn't change that fundamental premise. But it does add some enhancements that should please corporate database jockeys.

The major updates to this version of Magic include the following: Internet and World Wide Web capabilities; support for 32-bit environments, including Windows 95 and Windows NT on Intel Corp. and Digital Equipment Corp. Alpha platforms; and a host of internal and user-interface enhancements.

The release cootinues Magic's longtime support for rapid applicatioo development prototyping and database development.

For this review, we tested an evaluation versioo of Magic 7 on a Windows 95 stand-alone system, primarily focusing on the Magic development environment.

Building the structure

Magic is entirely a table- and forms-driven development environment. To build applications, developers first construct database files, fields, data types and keys. Those characteristics are assigned by the developer through a series of visual forms and don't require any coding.

Having created a basic database structure, developers then add program logic, which can be complicated but substantially less so than writing database programming code.

Uaing Magic's Program Dictionary, developers first create however many discrete program tasks will be required.

For example, an Update Orders task might be created to allow end users to open a Customer Orders file and make modifications to an order quantity. A subsidiary Task Execution definition determines precisely which database fields will be displayed on the user's screen. There are provisions for computed fields and an array of date, string, and logical functions associated with field-level data.

Screen layouts can be automatically generated by Magic or customized by the database developer. A complement of layout controls allow further customization, such as adding Microsoft Corp. OLE 2.0 documents, images or data to a record display.

Magic developers can run a syntax check or execute a program at any time throughout that process.

Report creation requires essentially the same visual process as described above and is fundamentally on different than developing a screen report. A help-development system allows the creation of online help screens.

Once you grasp the Magic development process, it is fairly simple to create databases, reports and programs without a lot of effort. But developers who favor procedural code may find it difficult to adjust to this entirely visual metaphor. Even embedded SQL is unavailable to Magic developers, although company officials say it will be available in a future version of the product.

Once a Magic application has been created and tested, it can be deployed to any other platform for which the Magic ruotime system is available. Operating system platforms that are currently supported include Novell, Inc.'s NetWare, Microsoft Corp.'s Wmdows NT and Windows 95, IBM's OS/400 and several Uoix flavors.

Magic 7 includes support for Btrieve Version 6.0 and Open Database Connectivity Version 2.0 database engines. Other databases gateways are available for Microsoft's SQL Server, Oracle Corp.'s Rdb, databases from Informix Corp. and nearly a dozen other databases. Prices for these gateways vary.

Internet middleware

Internet and Web functionality for Magic 7 applications are provided by the Magic WebLink middleware. The software, which wasn't tested for this review, acts as a translator between Magic pseudocode and Hypertext Markup Language (HTML) code.

As with other Web middleware, such as Borland International, Inc.'s IntraBuilder (see review, page 100), developers aren't required to write applications in HTML, and users need only an HTML-compliant browser to use the technology.

Magic WebLink functions with Windows NT servers such as Netscape Communications Corp.'s Commerce Server or Microsoft's Internet Informatioo Server.

Documentation for Magic 7 is extensive and well-organized.

Developers who are comfortable with the visual programming metaphor and the inherently proprietary bias of Magic will find it a viable solution for rapid application development in small to mid-size programming efforts. But Magic is a closed development and deployment system; once the decision to use it has been made, there is oo turning back.

Ray is an Internet consultant and writer in North Conway, N.H.

Documents

CONTINUED FROM PAGE 51

ment at Baxter Healthcare Corp. in Glendale, Calif., said his company uses DOCS Open, a document management system from PC DOCS, Inc. in Burlington, Mass. But it needs to communicate with a joint venture partner that uses a system from Documentum, Inc. in Pleasanton, Calif.

Time-saver

"This will give us the ability to transfer documents and give people read access to what they need," Bishop said.

Otherwise, documents would have to be placed on diskette and sent in the mail, she said. "This saves time and money."

The standard created by the ODMA eclipses a more comprehensive standard being developed by the Document Management Association (DMA), another document management standards group aimed at interoperability at the server level.

The ODMA traditionally has aimed its work at the desktop, bringing document management standards in line for applications such aa word processing.

Frappaolo said the move by the ODMA may confuse some users because members of this standards body are almost always members of the DMA.

But Marilyn Wright, vice president of standards and technical services at the Association for Information and Image Management (AIIM), oversees both standards groups and says the ODMA extensions are the tip of the iceberg compared with what the DMA will introduce in December. The DMA standards will include version control and check-in and check-out capabilities, she said.

The ODMA specification, while much more simple, will complement the DMA standards, Wright said.

Read all about it

The ODMA query extensions are at the AIIM World Wide Web site at www.aiim.org. For more information about ODMA, including a copy of the specification, product registration and membership information, contact Jeanette Rogers at (301) 587-8202, or by electronic mail at www.jrogers@aiim.org.

Oracle's vision

CONTINUED FROM PAGE 51

slides, they said.

"It's very difficult to assess the value of something that's not real, and this is not fully baked yet," said Charles Nettles, director of technology in the Information Technologies division at McKesson Corp., a pharmaceuticals distributor in San Francisco.

New approach

An approach such as NCA would be a welcome replacement for the variety of point products that McKesson has to use now to match clients with servers, Nettles said.

The current approach "gets very complex and therefore expensive to support," he said. "But I can't get my hands on [NCA-compliant] products today."

NCA "looks like a pretty reasonable architecture," said Erwin Berliner, manager of the database and performance division at Chevron Corp. in San Ramon, Calif. "But we need to get moving here early next year, and we can't just go on relying on vaporware stuff."

Chevron, which has about 25,000 desktops, desperately needs something such as NCA to help it cut down on the huge clients required to support the middleware mix it uses, Berliner said. But he said the company may have to orient itself more toward Microsoft Corp.'a Distributed Component Object Model, a rival to CORBA-based approaches.

Beatriz Infante, senior vice president of Internet and media products at Oracle, said most product details were intentionally left out of the NCA announcement. "If you present all that information at once, you kind of overwhelm the audience," she said. "But that doesn't mean the road maps aren't there."

Oracle spelled out its NCA-related shipment plans for only the next six months, and that touched on just a subset of its products.

"It's very difficult to assess the value of something that's not real, and this is not fully baked yet."

— Charles Nettles, McKesson Corp.

Infante said more specifics will be released at forums such as Oracle's user group conference next month.

But industry observers said it could take up to two years for Oracle's vision of a universal application server to come to fruition.

THE BUILDERS

"WHEN IT WAS TIME TO INTEGRATE 43 DATABASES INTO A WAREHOUSE... IT WAS TIME TO CALL THE BUILDERS."

PJ Matarese, Senior Analyst, Philips Semiconductors

When the competition heats up in the semiconductor business, you accurately match your manufacturing mix, customer demand and profitability or it's time to "cash in the chips." That's why Philips Semiconductors, one of the nation's largest silicon chip manufacturers, decided it needed a faster, more efficient system for key managers to analyze the information stored in the corporation's 40 operational databases. What was the solution? A Data Warehouse built with the help of EDA middleware, FOCUS Six reporting and analysis tools, and an experienced team of application experts... all from Information Builders.

Today, worldwide sales data from three continents is transmitted via TCP/IP network to Philips' data center in Sunnyvale, California. It's then loaded to a mainframe Data Warehouse using EDA middleware technology for data access and migration. Managers and business analysts in Marketing, Sales and Finance access and analyze the warehouse data with FOCUS Six for Windows EIS Edition, and use FOCUS Six Reporter to create ad hoc reports. The result... business managers keep manufacturing in sync with market demand through better forecasting; while IS managers spend their time developing other strategic systems instead of generating 300 pounds of custom reports each month.

Philips Semiconductors is just one of thousands of examples of how Information Builders has partnered with the world's leading corporations to build enterprise-level reporting and analysis systems. Find out how Information Builders' technology and services can help your organization. Call us at 800-969-INFO.

http://www.ibi.com

800-969-INFO

In Canada Call 416-364-2760

Information Builders

FOCUS and EDA/SQL are trademarks of Information Builders, Inc., NY, NY 212-736-4433 E-mail: info@ibi.com WWW: http://www.ibi.com

Users not clamoring for Office 97

By Lisa Picarille

A major update to Microsoft Corp.'s Office suite of productivity applications is due by year's end, but some users said they don't plan to deploy the forthcoming release immediately.

While Microsoft doles out weekly information updates on the package, some of Office's bread-and-butter corporate users recently listed the following reasons for taking the wait-and-see approach:

- Users haven't yet deployed Windows 95, which is required for optimal Office 97 performance.
- Users are skipping Windows 95 in favor of NT and concentrating on deploying that operating system.
- Some users claim they have yet to outgrow the current version of Office.
- Users need time to sort through the update, which is packed with new features.

"We haven't even moved to Windows 95 yet," said an information systems director at an East Coast manufacturing firm who requested anonymity. "I have many other more pressing issues, like upgrading desktops and servers. The new version of Office is the least of my worries. The old version is serving us just fine for now. There is no way to cost-justify the upgrade."

One developer said corporate users who already have Windows 95 are more eager to deploy Office 97.

"Our users are relatively interested in getting their hands on Office 97 because of the new features in Access and Excel," said Michael Mullin, director of sales and marketing at MTX International, Inc. in Englewood, Colo. The company develops an Office-compatible accounting system.

But Mullin estimates that only 20% to 30% of MTX's 2,000 customers will deploy Office 97 when it becomes available at the end of the year.

Feature-packed

One user said Office 97 is such a major release that it will take some time to wade through the new features and determine a deployment plan.

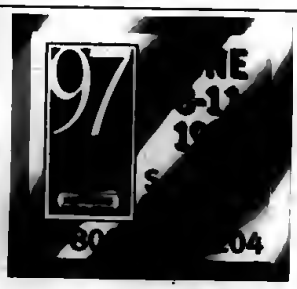
"There is so much in the new version that I'll have to evaluate the product and determine which users need to have it first and then go from there," said Brian Moura, city manager for San Carlos, Calif.

But one analyst said despite the new features in Office 97, most users haven't outgrown the current version.

"It's getting harder and harder for suite developers to come up with compelling new features that will excite users enough to make them upgrade," said Jeffrey Tarter, editor of "Softletter," a newsletter in Watertown, Mass. "Unlike cars, software doesn't rust, and so a lot of users can't cost-justify upgrading every 12 to 18 months."

One user said his company plans to move to NT in the next two years. Therefore, it won't be rolling out Office 97 to its 500 users in the near future, he said.

"I can't really say when we'll get to deploying [Office 97]. Hopefully, it will be before [Microsoft] comes out with Office 98 or 99," said Peter Bavoso, vice president of IS at The Darby Group, Inc., a Westbury, N.Y., pharmaceutical company.



COMPUTERWORLD
CUSTOM PUBLICATIONS

A well-established media solution used by leading IT marketers

Since 1990 Computerworld Custom Publications has been the custom print choice for market leaders such as Microsoft, Hewlett-Packard, Oracle, Informix and Sun Microsystems. Having produced over 100 White Papers and custom

High readership among a premier IS audience

High readership scores from recent Roper Starch studies demonstrate the added effectiveness of placing your custom publication in Computerworld. These studies listed custom publication advertising among the

Turnkey programs provided by an expert staff

Our in-house custom publication staff serves as your marketing partner in the planning, design and production of your custom publication—for insertion in Computerworld and/or other delivery vehicles you specify.

THE BUILDERS

I want to use the Internet to create reports from my corporate data.

- ❑ Please send me additional information on WebFOCUS
- ❑ Please send me a FREE white paper: "Deploying Enterprise Reporting Systems over the Internet".
- ❑ Please have a sales rep call ASAP.
- ❑ I want to attend a FREE Seminar.

NAME

TITLE/DEPT.

COMPANY

ADDRESS

CITY STATE ZIP

( )
TELEPHONE

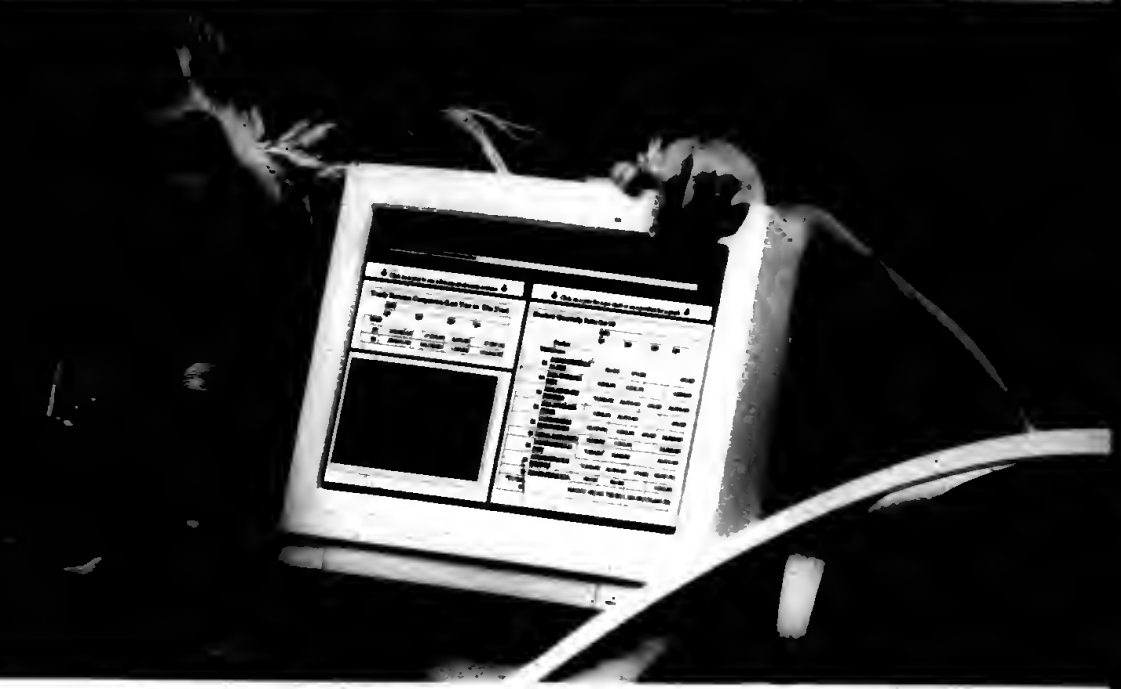
http://www.ibi.com

Information Builders
800-969-INFO

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES
BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1305 NEW YORK, NY
POSTAGE WILL BE PAID BY ADDRESSEE
ATTN: Product Information Center
Information Builders
P.O. Box 1461
New York, NY 10117-1484

THE BUILDERS

"EVERYBODY'S WEB SURFIN' THE WebFOCUS WAY.



Sing to Tune of *"Surfin' USA"*

If everybody had WebFOCUS
Across the USA
Then everybody'd do reporting
The WebFOCUS WAY

They could access any data
In the Enterprise
Styled reports on their browsers
Before their very eyes

Don't have to know FOCUS
Or even S-Q-L
Transforms your answers
To H-T-M-L

Aggregation on server
Thin clients here to stay
Better order WebFOCUS
Call THE BUILDERS Today

Information Builders
Web Ready Technology

http://www.ibi.com
800-969-INFO
In Canada Call 416-364-2760

Information Builders

FOCUS and WebFOCUS are trademarks of Information Builders, Inc., NY, NY 212-736-4433 E-mail: info@ibi.com

IT'S ONLY LOGICAL THAT INTELLIGENT MANAGEAB

(NOW, WHAT THE HECK IS IN

Intelligent Manageability is kind of like Extra Sensory Perception for a computer and every new Compaq Deskpro has it. It lets you know if something's going to happen before it actually does. This way you can manage all of the desktops on your network from one location.

Taking inventory, for instance, of all hardware and software is done simply and efficiently from one Deskpro. Or if a hard drive's about to fail anywhere, you'll know ahead of time. As before, Intelligent Manageability backs up your data on the network in case of failure; but now, thanks to our new PD-CD drive backup, it also preserves your data locally.

Okay, so our newest version of Intelligent Manageability is smart. But affordable? Considering that the Deskpro line from Compaq starts at around $1,100,* we think so.

Equally impressive are the high-performance features. Up to Pentium® Pro 200 processors. Choice of PCI graphics. Plus a choice of EIDE and Ultra SCSI hard drives.**

And maintenance? That's easy because we deliver continually updated support software via our Web site and CDs. And so is upgrading and servicing, thanks to a quick-release CPU hood and accessible components.**

In the end, Intelligent Manageability gives you a lowered cost of

I'm burnt.
I need a vacation.

©1996 Compaq Computer Corporation. All rights reserved. Compaq and Deskpro registered U.S. Patent and Trademark Office. Deskpro is covered by our 3-year limited warranty. *Price mentioned is estimated street price. Dealer prices may vary. are registered trademarks and the Pentium Processor Logo and the Pentium Pro Processor Logo are trademarks of Intel Corporation. Other products mentioned may be trademarks or registered trademarks of their respective companies.

ILITY ALSO COMES WITH AN INTELLIGENT PRICE.

TELLIGENT MANAGEABILITY?)

Call MIS.

ownership, a three-year warranty and dedicated toll-free technical support that's open for business seven days a week, 24 hours a day. And what could possibly be more logical than that? For more, visit us at www.compaq.com or call 1-800-392-8883.

*The Deskpro line starts at around $1,100.**

COMPAQ

Has It Changed Your Life Yet?

*Features vary by model. Monitor not included. Thermal sensor available only on Deskpro 4000 and 6000. Some features available with Compaq Deskpro and independent software applications. Other features only available with Windows 95. The Intel Inside Logo and Pentium

Application Development

Users may not dance to Castanet rhythm

By Frank Hayes

Can Java deliver the goods? Marimba, Inc. is beta-testing a Java-based system for distributing software and data across the Internet and corporate networks. While not without its appeal, the system might be overkill for most organizations.

The new system, Castanet, was designed to let users automatically download updated content — from interactive games to constantly changing marketing material on the World Wide Web. But for corporate information systems shops, its strongest appeal could be for delivering new versions of application software across corporate networks, according to the Palo Alto, Calif., company.

"This has pretty profound implications for the MIS director who's a little bit tired of having to reinstall the operating system or applications every time a new version or bug fix comes in," said Karl Jacobs, CEO of Dimension X, Inc., a Web site producer in San Francisco that is testing the software.

Realty Highway's Greg Colbert *uses the more traditional Visual Basic for software updates*

But Castanet was designed for updating many users across the Internet and hence might be too much for corporate sites with more modest distribution needs. Most corporate IS departments only occasionally need to update software, which can be done with more conventional technology, users said.

"It's not a very hard problem to figure out how to service a workgroup of a few hundred or even a thousand people. There's groupware for that, using the Internet or Lotus Notes or whatever," said David Bernstein, a vice president in the advanced technology group at AT&T Corp. in San Jose, Calif., another Castanet beta site.

Not that big a deal

"The process of keeping people up to date isn't overwhelming," said Greg Colbert, vice president of operations at Realty Highway, Inc. in Honolulu. His company built an automatic self-updating capability into a new Visual Basic application, using more conventional technology.

"If the update is only a version or two, we just download the changes," he said.

Although it may be more than most corporate users need for application updates, some IS shops might find Castanet useful for updating rapidly changing information, especially data that will be shared with mass-market customers.

"We're interested in very large-scale applications for our subscribers — think AT&T-size," said Bernstein. "That takes a system that can scale to very large numbers of users."

Castanet is written in Java, Sun Microsystems, Inc.'s Internet language, so it can run on virtually all desktop platforms.

Users will run a Java application called a tuner to connect to a server and download new material. The system will cost between $995 and $15,000 when it ships later this year, depending on the number of users and configuration.

Peer Logic lets applications communicate through Pipes

Firm gets patent for technology to send messages across platforms

By Michael Goldberg

Although the technology is still quite young, signs show that message-oriented middleware is starting to grow up.

The latest rite passed was the recent patent award to Peer Logic, Inc. for its Pipes middleware, which users and observers say offers the scalability and availability required by widely distributed applications.

Message-oriented middleware allows an application to send a data message to another application running in a different computing environment. The message could be a request from a PC-based application for data from a legacy system. This means application developers don't have to write new communications code so mainframe applications can send and receive data from computers that run Unix or Windows NT, for example.

Message-oriented middleware

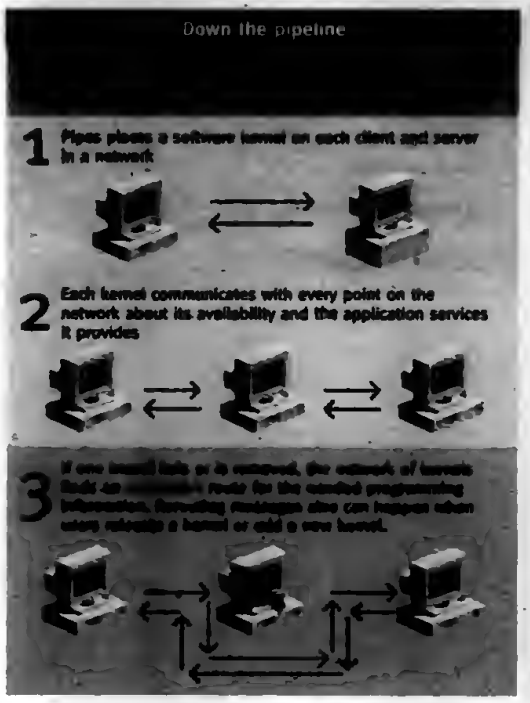
Pipes places a software kernel on each client and server in a network. Each kernel then communicates with the other kernels about its availability and what services it provides. If one server fails, the network of kernels reroutes application requests and other programming information (see chart). This "self-healing" feature is the core of Peer Logic's patent.

Analysts said this technology could complement, not compete with, more-established directory-based products such as IBM's MQSeries. At the same time, analysts said Pipes faces an uphill marketing fight because only leading-edge shops are tackling message-oriented middleware.

But that seems to be changing. Early this year, Digital Equipment Corp. touted its DECmessageQ product as a bridge between IBM mainframes and Digital servers.

And IBM's MQSeries has started to attract tool offerings from systems management software vendors to help users handle growing networks of applications [CW, Sept. 16].

Application developers at Blue Cross/Blue Shield of Oregon have used Pipes middleware since 1994 to help customer service representatives who use PCs to access information on mainframes, HP 3000 minicomputers and Unix servers.


Down the pipeline
1
Pipes places a software kernel on each client and server in a network
2
Each kernel communicates with every point on the network about its availability and the application services it provides
3

Blue Cross found it could distribute information from disparate systems to 200 customer service representatives and save its customers time and money on staff training, said Kip Stevenson, manager of systems development at the health plan organization in Portland, Ore. The end users learned one graphical user interface instead of several, thereby reducing training costs, he said.

Building such applications is a prime benefit of message-oriented middleware, but Stevenson said Pipes' scheme for routing messages in case a server fails helps keep applications running. "It knows which [network nodes] are conducting which functions. And if one particular node or server becomes dysfunctional, it knows which others can take the workload," he said.

Wall Street

CONTINUED FROM PAGE 51

lates in his head for the different rules mandated by the firm," MacIlwaine said. "With the Java application, we've already built a validation server. When an order comes in to the server, we can tell if they've passed validation — or if not, why they haven't. ... That probably cuts brokers' time by 50%."

Tracy Corbo, an analyst at International Data Corp. in Framingham, Mass., said financial firms are moving toward Java but haven't deployed many critical applications on it yet. "That's clearly what they're looking to, though," she said.

Mark Luppi, senior vice president at New York-based Lehman Brothers, Inc., said it will be a year or more before Java-based mission-critical applications appear on Wall Street trading floors. But now is the time to start developing them, he said. Luppi, who focuses on Lehman's computer architecture, said he wasn't speaking for the firm as a whole.

Luppi said he is considering replacing C++ applications on the trading desks. "It's the technology of the Internet," he said. "We see the Internet and the desktop merging over time. The language for that will be Java. For us, there's nothing else."

LAWSON

The revolutionary thing about our Web-deployable applications is that Mac and PC users can share them.

(Now let's all hold hands and sing Kumbaya.)

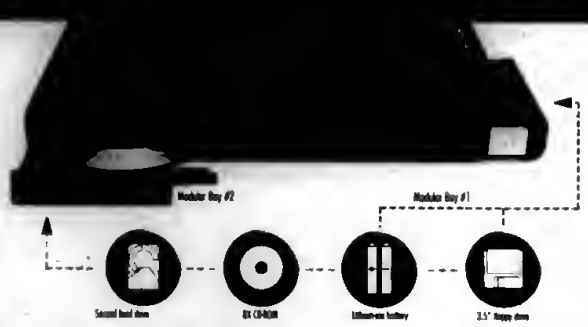
©1996 Lawson Software

With the arrival of the LAWSON

INSIGHT™ Business Management System

comes peace at last. Suddenly every workstation with a Web browser can access the same information, breaking down functional barriers and smoothing the way for Activity-Based Management. And it's far less expensive than maintaining a wide-area network. Our world-class financials, human resources, procurement and supply chain process suites support virtually any client/server platform. What's more, our licensing policy lets you migrate through future technological changes and upgrades without additional licensing fees. LAWSON INSIGHT. *Because the future can't wait.*

GET DESKTOP POWER WITH NEW-FOUND FREEDOM.



Take your work soaring to new heights.

Portable computing is a breeze with the **Millennia TransPort™** notebook system from Micron Electronics. Its exclusive FlexOpt™ dual-bay modular design frees you to mix and match devices for a variety of customized choices. Drop in a modular CD-ROM drive to enhance multimedia capability. Add a second intelligent modular lithium-ion battery for up to eight hours' use without recharging, or add a 2.1GB hard drive to increase your storage capacity. There's built-in flexibility, too—an innovative Pick-a-Point™ system with touchpad or pointing-stick operation and an infrared port for walkup, wireless printing to compatible printers. And don't forget our industry leading Micron Power™ warranty. Let your imagination soar with the portable power of the Millennia TransPort™ notebook system. *Actual battery performance will vary depending on applications and configurations. Based on two 9-hour batteries.

Millennia TransPort

Standard Features

- Mobile Intel Pentium® processor
- Intel 430MX PCI chipset
- 256KB L2 pipeline burst cache
- 8X modular CD-ROM drive
- PCI graphics accelerator, 1MB EDO RAM
- Pick-a-Point™ dual pointing devices integrate both pointing stick and touchpad
- Removable EIDE hard drive
- 3.5" modular floppy drive
- Intelligent modular lithium-ion battery
- 16-bit stereo sound
- Built-in stereo speakers and microphone
- 2 Type II or one Type III PCMCIA slots
- S-video and NTSC video outputs
- Headphone, microphone and line-in jacks
- 2 infrared ports, one front, one back
- Parallel, serial, VGA and 2 PS/2 ports
- Dimensions: 11.7" x 9.4" x 2.0", 6.9 lbs.†
- Nylon carrying case
- Microsoft® Windows® 95 and MS® Plus! CD
- Microsoft Office Pro 95 and Bookshelf® 95 CDs
- Kensington™ security lock ready‡
- 5-year/3-year Micron Power™ warranty

†6.9 lbs. includes 3.5" floppy and one battery.
‡Lock secures both Millennia TransPort and MicronDock

intel inside pentium

Designed for Microsoft® Windows®95

- 133MHz mobile Intel Pentium Processor
- 16MB EDO RAM (48MB max.)
- 12.1" active matrix color display, 800 x 600
- 1.3GB removable hard drive

$4399
Business lease $150/mo

- 133MHz mobile Intel Pentium Processor
- 32MB EDO RAM (48MB max.)
- Motorola® Montana 28.8 fax/modem
- 12.1" active matrix color display, 800 x 600
- 1.3GB removable hard drive
- 2nd lithium-ion battery

$5199
Business lease $163/mo.

- 150MHz mobile Intel Pentium Processor
- 32MB EDO RAM (48MB max.)
- Motorola Montana 28.8 fax/modem
- 12.1" active matrix color display, 800 x 600
- 2.1GB removable hard drive
- 2nd lithium-ion battery
- Samsonite® leather carrying case

$5550
Business lease $174/mo.

Options

- With 150MHz Mobile Intel Pentium processor ..... add $200
- With 16MB DIMM module upgrade ..... add $349
- With 32MB DIMM module upgrade ..... add $749
- With 2nd lithium-ion battery ..... add $199
- With primary 2.1GB hard drive upgrade ..... add $100
- With 2nd removable hard drive (1.3GB) ..... add $599
- With 2nd removable hard drive (2.1GB) ..... add $699
- With 3Com® Ethernet 10BT PCMCIA ..... add $149
- With Motorola Montana 28.8 fax/modem ..... add $259
- With MicronDock™ multimedia port replicator ..... add $299
- With MicroFax™ desktop package ..... add $799

Micron Power Warranty & Support

- 5-year limited warranty on microprocessor and main memory
- 3-year limited parts-only system warranty
- 1-, 2-or 3 year optional on-site service agreement for Micron desktop systems
- 30 days of free Micron-supplied software support for Micron desktop systems
- 30-day money-back policy
- 24-hour technical support

Purchasing is subject to our current offerings. Limited warranties and terms and conditions of sale apply. Some restrictions may apply. Call for complete details. Copies of the limited warranties may be obtained at our Web site or by calling Micron.

MICRON ELECTRONICS, INC.

800-214-6675

http www.micron.com

900 E. Karcher Road, Nampa, ID 83687 • Mon-Fri 6am-10pm Sat 9am-5pm (MT) • International Sales Hours: Mon-Fri 6am-7pm (MT) • 208-893-3434 • Fax 208-893-3424 • Purchase Order Fax 208-893-8992
Technical Support Available 24 Hours A Day—7 Days A Week • Technical Support E-mail: techsupport.micron@micron.com

©1996 Micron Electronics, Inc. All rights reserved. Micron Electronics is not responsible for omissions and/or errors in typography or photography. Prices and specifications may be changed without notice. Prices do not include shipping and handling. 30-day money-back policy does not include return freight and original shipping/handling charges. Applies only to Micron brand products and begins from date of shipment. All sales are subject to Micron Electronics' current terms and conditions of sale. Lease prices based on 36-month lease. Intel, Intel Inside and Pentium are registered trademarks of the Intel Corporation. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation. All other service marks, trademarks and registered trademarks are the property of their respective companies. TPNE-CMWD-961021

The Enterprise Network

Briefs

AS/400 manager

NetTech, Inc. last week introduced software that can help combine management of IBM AS/400 systems with the leading network platform. EView/400 provides a graphical user interface for managing AS/400 network environments from the Network Node Manager console of OpenView from Hewlett-Packard Co. Later this year, NetTech, in Raleigh, N.C., plans to add support for IBM's NetView for AIX console. Cost is $2,000 per AS/400 and $5,000 per management console.

Wireless E-mail

WorldCom, Inc., a global network based on Lotus Development Corp.'s Notes, is beta-testing a wireless electronic-mail access service. Wolf Communications Co., which runs WorldCom, will use Motorola, Inc.'s AirMobile software and Ardis Co.'s wireless network. The service will be generally available by year's end.

VMS tied to 'net

Cisco Systems, Inc. has announced Release 4.0 of its MultiNet for OpenVMS software, which lets users tie Digital Equipment Corp. VAX and Alpha-based systems to corporate IP networks and the Internet. The new version includes enhanced network printing and file services software and Dynamic Host Configuration support, which lets users share IP addresses. Release 4.0 is available starting at $37,000 for a 25-system license. It can be used for mixed VAX/Alpha platform sites.

New tactics expand WANs

Users lobby carriers, build their own

By Bob Wallace

Although it is commonplace for IS managers to run campus backbone networks at 100M, 155M and even 622M bit/sec., it isn't common to find carriers that offer pipes that fast to link the dispersed sites.

As a result, the wide-area network becomes a bottleneck for information systems managers who build enterprisewide networks. That forces them to become savvy negotiators, if not construction engineers, to deal with the predicament.

Backbone networks

They have two options: They can persuade their carriers to build backbone networks with bandwidth greater than the 1.54M bit/sec. of a T1 line or the 45M bit/sec. of a T3 link, or they can build their own high-speed backbone.

Bob Yannocone chose the first option for Pace University in New York. The school wanted an Asynchronous Transfer Mode (ATM) backbone network to link its six campuses, but its carrier, Nynex Corp., didn't plan to offer ATM for another one to three years.

Yannocone, manager of operations and network administration at Pace, persuaded Nynex to install 40 miles of fiber to link the campuses at 100M bit/sec. Fiber Distributed Data Interface (FDDI) speed.

"We were happy with the reliability of the T1s we had between sites, but we just didn't have enough bandwidth," Yannocone said. "And we realized that the FDDI approach would cost less than adding more T1s or even installing multiple T3s."

The liberal arts university still intends to move to ATM. "We structured our contract so that we can upgrade to ATM when it becomes available from Nynex without penalty," Yannocone said. Officials at one Pace department would like to use ATM to support a distance-learning application.

Many users — including Union Pacific Railroad Co. — have gone with the second option.

The railroad is moving toward deploying 100M bit/sec. Fast Ethernet at some of its largest offices. It has fiber linking many of its far-flung offices and runs numerous T1s over the links.

"We're responding by turning up a 45M bit/sec. ATM connection on the fiber between data centers in our headquarters in Omaha and a large office in St. Louis," said Brett Frankenberger, a telecommunications engineer at Union Pacific. "We find this to be a more attractive alternative to going with the carrier option. We can up the speed on its fiber by upgrading the switching gear on either end of the links."

Outsourcing giant Computer Sciences Corp. (CSC) is headed down the same track as Union Pacific. CSC, the prime contractor for NASA, decided to move to its own ATM network to link high-speed networks at several far-flung sites.

"A conservative estimate showed we would save roughly 30% [on monthly WAN charges] by going with ATM instead of 15 T3s," said Steve Fall, a systems scientist at CSC in Huntsville, Ala. The private network approach can

Bottlenecks, *page 64*

Allen Lund Co.'s Ken Lund *says his family's firm is 'the absolutely ideal company' for voice over frame relay*

Voice over frame connects

By Kim Girard

At a time when many network managers are just starting to ask questions about how voice over frame relay works, Ken Lund has been there, done that.

A year and a half ago, Lund, network integrator at Allen Lund Co., his family's truck transportation brokerage in LaCanada-Flintridge, Calif., was considering a circuit upgrade from 9.6K to 56K bit/sec. to handle increasing data traffic on the company's network.

Instead of upgrading the circuits, Lund decided to move to a frame-relay network.

He found it hard to pass up the estimated savings of about $6,000 per month on a $45,000 bill for data services. Integrating voice on the frame-relay links would enable the company to save another $1,500 to $2,000 per month by eliminating per-minute phone charges and the cost of multiple line connectivity, he figured.

So officials at the company, which uses MCI Communications Corp. as a carrier and Micom Communications Corp. data and voice integration products, decided to deploy voice over frame relay to connect its 13 sites, which sprawl from Orlando, Fla., to Vancouver, British Columbia, and employ 100 people. Because potential savings were so enticing, Lund said, the company completed the entire $7,000 installation in three months, doing the bulk of the work itself.

"We are the absolutely ideal company for [voice over frame]," Lund said. "We're spread out. We don't do a high volume of data."

But voice over frame relay is "a happy accident" that doesn't work for everyone, said Tom Nolle, president of CIMI Corp., a telecommunications consultancy in Voorhees, N.J. The service is only as cheap as the carrier's frame-

Voice over frame, *page 64*

NetWare managers get relief

Load taken off for managing NetWare Loadable Modules

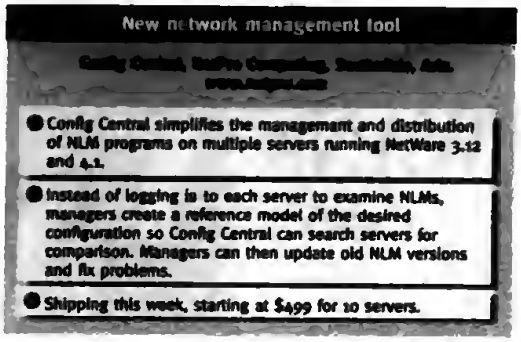
By Patrick Dryden

Managing many servers based on Novell, Inc.'s NetWare is about to get a lot easier, according to beta testers of a tool that NetPro Computing, Inc. is expected to ship this week.

Config Central provides a way for administrators to scan their servers to find out which NetWare Loadable Modules (NLM) reside there, in memory and on disk. It can then update those vital programs according to a central reference server so that each system has the correct version.

Such distribution capability spells relief for NetWare administrators because they must log in to servers, individually and frequently, to fiddle with dozens or even hundreds of NLMs.

"Managing NLMs is a full-time occupation for those of us with hundreds of servers," said beta tester Scott Sattler, a server consultant at Cargill, Inc. in Minneapolis.


New network management tool
Config Central simplifies the management and distribution of NLM programs on multiple servers running NetWare 3.12 and 4.1.
Instead of logging in to each server to examine NLMs, managers create a reference model of the desired configuration so Config Central can search servers for comparison. Managers can then update old NLM versions and fix problems.
Shipping this week, starting at $499 for 10 servers.

Administrators at the agricultural supplier spend between 30 minutes and one hour updating NLMs on each of 500 servers worldwide, and the patches or new versions arrive weekly, Sattler said. Novell's ManageWise helps report on NLMs, but it doesn't help distribute them, he said.

"Some companies just leave NLMs alone until the server crashes. But now there's an easy way to keep them up to date," Sattler said. "There's nothing else out there that can push NLMs out to servers pretty much automatically."

At a financial firm that has nearly 200 NLMs running on some of its hundreds of NetWare servers, "we have a big problem tracking which ones have both the correct version number and date for each file," said the beta tester, who asked to remain anonymous.

Novell provides the site with some custom tools to help manage NLMs, but those still require administrators to work server by server, the beta tester said. "Config Central will give us the ability to be more proactive because we can screen multiple servers against one reference configuration," he said.

After installing, modifying and updating NLMs on this reference server, administrators let Config Central scan the rest of the NetWare 3.12 or 4.1 servers. The tool highlights unexpected or outdated NLMs, builds reports and can then update files from the reference or let the operator troubleshoot the configuration.

Autopilot

"I've been looking for something more automatic than manual for a long time," said beta tester Andy Von Der Bruegge, a computer information specialist at the Missouri Department of Health in Jefferson City.

"Now I can set up push/pull distribution of new NLMs and quickly configure the NLMs on new servers we install," he said.

Server management tools from BindView Development Corp. in Houston help check on NLMs but can't automate updates or generate reports easily, Von Der Bruegge said.

Other NetWare users are eager to evaluate Config Central.

Network administrator Johnny Olivas created batch files to automate the distribution of NLM updates to 180 servers throughout Phillips Petroleum Co. in Tulsa, Okla. "But I'd rather manage servers without having to deal with them individually," he said.

At Buck Consultants, Inc., a benefits consulting firm in New York, systems programmer Clem Bowen must run reports on 45 servers, then compare them to check NLM versions. "Any way that cuts down the work we do now server by server will be a big help," he said.

NetPro Computing, in Scottsdale, Ariz., has set Config Central's starting price at $499 for 10 servers.

Vendors turning to directories

By Tim Ouellette

Electronic-mail integrators and vendors are catching on to the fact that users want simple and centralized directory services.

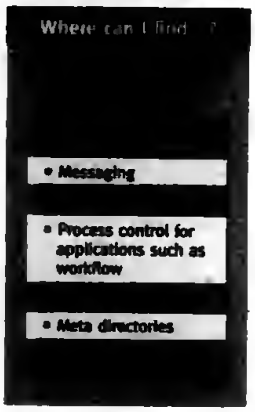
To that end, Control Data Systems, Inc. has unveiled a suite of security, messaging and information access products, called Rialto, around its X.500 directory.

Allé Enterprise Systems Ltd., a vendor of Internet-based E-mail systems, later this month will outline plans for a directory services product line.

Users stand to gain because they can reduce the number of directories they maintain for E-mail, database applications and network resources and still have nearly universal client access to the directory from almost any type of application.

"To me, the directory is the foundation for doing all sorts of things" beyond E-mail, said Lee Croatt, director of U-Card Information Systems at the University of Minnesota in Minneapolis.

The school has created an



X.500 directory with Control Data's help, and Croatt said packaging the various services was a good move.

Control Data, in Arden Hills, Minn., has long been an integrator of diverse E-mail systems. And the X.500 Internet standard for structuring directories has been a major focus for it.

The product comes at the right time, some observers say. According to the Burton Group, a research firm in Salt Lake City, directory services will become one of the most pressing technology issues for users over the next three to five years.

For example, after installing the directory for E-mail, "all of a sudden we had other things we wanted to do with it beyond using it for E-mail," Croatt said.

The Rialto suite includes:

- The Control Data Global Directory Server.
- Security rules entered into the directory.
- IntraStore, a message storage server, and MailHub, a message integration server, set to be upgraded later this year.
- Info-Engine, software that tracks user-defined information needs and searches for that information on the network with the help of the central directory.

Enterprise Solutions, in Westlake Village, Calif., is expected to outline some of its directory plans at the Internet Expo in Boston this week.

Voice over frame

CONTINUED FROM PAGE 63

relay tariffs and can be used only internally because the public won't tolerate the voice quality, he said.

Frame relay

CD-quality sound

Lund said voice quality on the network is much improved since the company upgraded five months ago to a Micom ClearVoice system. Simi Valley, Calif.-based Micom claimed the new system delivers the quality of the public telephone system at 8K bit/sec.

"It's like going from tape to CD," Lund said. "They've just cleaned it up."

Monitoring and tracking

To monitor phone performance on the network, Lund listens in at times. He also uses Micom's PC-based software, Netman, to track incoming and outgoing calls. Daily reports show that 95% of calls connect successfully, he said. When voice traffic gets heavy, Lund adds to the company's multiplexer cards that provide more capacity to keep the system running.

The company uses one Unix system to book more than 4,000 truckloads for customers monthly. Employees use the system for all invoices and order confirmations.

Coordinating the lines and equipment from a local telephone switch that connects to a long-distance line and back to a T1 line on the end of one of the company's branch offices was a challenge, Lund said.

"One thing wrong anywhere in that chain, and you don't get a connect," he said. "It's very hard to troubleshoot in the beginning. But once it's configured, I can connect anything."

Bottlenecks

CONTINUED FROM PAGE 63

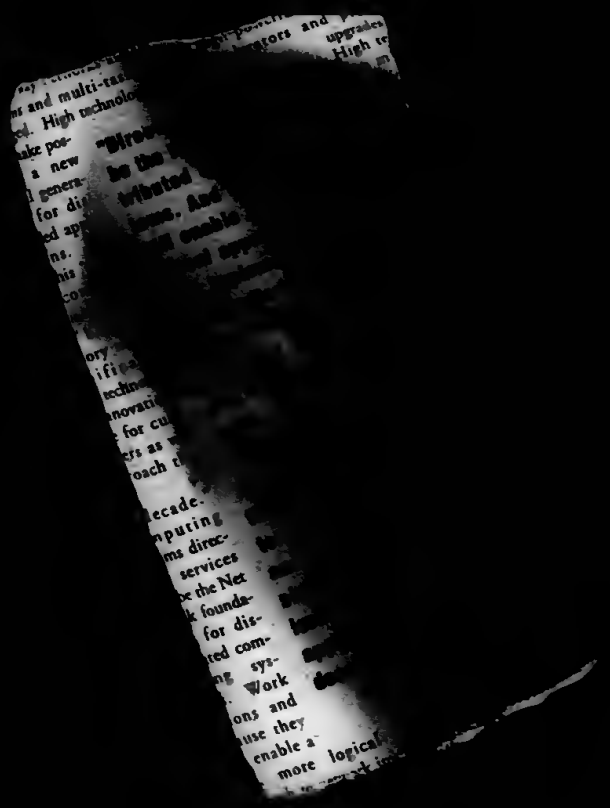
he easier than dealing with local and interexchange carriers — for long-distance networks.

But not all users need 100M bit/sec. or higher WAN links, though many are headed in that direction.

"The wide area is always the bottleneck, which is why we're upgrading our entire leased line network to public frame-relay service," said Rob McKenna, telecommunications manager at Sumitomo Bank Ltd. in New York. The company runs switched Etherpet on its campuses and is just now beta-testing Fast Ethernet products.

The frame-relay network comprises 256K bit/sec. links to Sumitomo's offices in New York, Hong Kong, London and Tokyo. The firm previously used 64K bit/sec. private lines. "Adding leased lines is a more expensive alternative," McKenna said. "Frame relay gives us the ability to burst when we need additional bandwidth without paying for all of it."

Okay,
So This Is The Future
Of The Enterprise



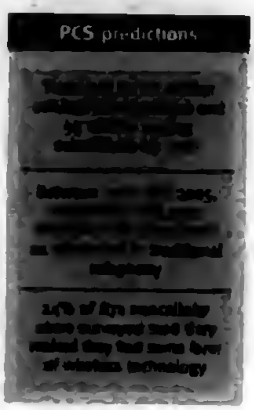
AT&T rolls out wireless digital

By Kim Girard
and Mindy Blodgett

AT&T Corp. has announced a nationwide wireless digital cellular service that will position the company as the biggest provider for road warriors who demand roaming cellular service.

AT&T's wireless service, Digital PCS (personal communications services), is available in 40 cities across the U.S.

It is based on the company's 850-MHz cellular network. The Digital PCS name refers to enhanced paging, messaging and electronic-mail services the company offers with its new digital cellular telephones. But the service is unrelated to the PCS digital network AT&T is building.



Source: The Yankee Group, Boston

AT&T paid $1.6 billion for PCS licenses at the Federal Communications Commission auction last year. Those licenses are based on the 1,900-MHz PCS frequency. Services offered on the two frequencies — voice, paging, short messaging, Caller ID and voice mail — are expected to be nearly identical.

AT&T next year plans to offer a dual-band, dual-mode phone that will operate on both frequencies and potentially reach 212 million customers.

AT&T's use of the PCS label in reference to its cellular network confused some customers and analysts. But AT&T Chairman and CEO Robert Allen argued that "consumers really don't care about frequencies; they care about services."

"It's a lot of hype," said Jeffrey Kagan, president of Kagan Telecom Associates in Atlanta.

"It seems as though they're trying to counterstrike Sprint's success with PCS" in the Washington area, Kagan said.

Pacific Bell also offers a 1,900-MHz service in San Diego. Other companies that plan offerings for later this year include Primeco Personal Communications and a joint venture between Bell Atlantic Nynex Mobile and AirTouch Communications, Inc.

Mass launch

The AT&T rollout in 40 markets simultaneously is much more powerful than the city-by-city introductions of competing carriers, observers said. AT&T's digital cellular service packages start at $24.99 per month, with a nationwide roaming fee of 60 cents per minute. Some users said that price was a bit high. The price for a phone starts at $150.

George Vasquez, director of information technology at Saint Agnes Medical Center in Fresno, Calif., is testing the phones before he buys them for nurses, pharmacists and other staffers who need to relay information about medication, treatmeot and other patient needs.

"Now the people [have to carry] both cellular and pager," Vasquez said. "But this new phone may change that so we don't have to have both."

"The main reason I switched over is that the digital system saves a lot of my time," said Brad Gooding, a certified public accountant in Dallas. He ditched his analog phone for the AT&T phone. "I'm not calling my answering machine or my answering service, and I don't have to have my beeper," he said.

Analysts said confusion between the two AT&T PCS services is likely to persist. Complicating matters, AT&T's Wireless Services has been championing Cellular Digital Packet Data (CDPD), a wireless data transmission technology that is an overlay on voice cellular networks.

CDPD offers more data transmission capabilities than PCS or digital cellular, which will be little more than paging, said William Frezza, an analyst and consultant at Wireless Computing Associates in Yardley, Pa. But CDPD has been slow to catch on.

Bay extends switching line

Low-cost Ethernet switch included in deluge of products

By Bob Wallace

Bay Networks, Inc. last week unveiled its lowest-priced desktop Ethernet switch, at $217 per port, just a week after 3Com Corp. rolled out a similar switch at $120 per port.

The BayStack 301 Desktop Ethernet Switch was among a raft of products announced by Bay in the past two weeks, including many offerings that will let users build more robust and flexible wide-area corporate data networks.

The products include shared Fast Ethernet modules for Bay's System 3000 and System 5000 hubs, a feature-rich branch-office router, hardware-based compression and a router configuration package.

LAN/WAN

Power boost

Bay addressed a void in its router line with the Advanced Remote Node (ARN), a branch-office router that includes a more powerful processor than its predecessor.

The router includes up to two LAN and five WAN links.

Base pricing for an ARN with one Ethernet link and two serial ports is $2,195.

Bay's Advanced Remote Node

Description:	Branch-office router
Base configuration:	One LAN interface (Ethernet or Token Ring), two synchronous WAN connections
Maximum configuration:	Two LAN, five WAN interfaces
Processor:	Motorola 68040 and 68360
Software bundled:	Bay's BayRS routing software
Base price:	$2,195
Availability:	November

It will ship next month.

"Before the ARN, there was a jump in price from its $3,000 low-end router to $10,000 for the next larger model, which means they're filling a key gap for us," said Eric Ferguson, a network engineer at Maryland Insurance Group in Baltimore.

"The ARN's support of legacy protocols would make it a great fit for at least the 20 offices where we have lots of PCs using terminal emulation. We wouldn't need the emulation with the ARNs," Ferguson said.

The ARN will "fare particularly well with Bay customers, but other users will find that competing products from 3Com and Cisco cost less," predicted John Morency, a principal at The Registry, Inc., a consulting and research firm in Newton, Mass.

New compression hardware will allow some Bay products to boost data rates from 2M to 16M bit/sec. over private lines, frame relay and Integrated Services Digital Network lines.

"With Bay's compression, we can support 2-to-1 compression at remote sites and cut our WAN costs by 30%," Ferguson said. The hardware is available now. Pricing starts at $3,000.

Bay also won analysts' praise for ControlCenter, a graphical package that lets network administrators configure and download software to groups of routers instead of one router at a time.

The old process is time-consuming for large corporations with dozens of far-flung sites.

Bay booster

"This is a differentiator for Bay that 3Com and Cisco can't quite match," Morency said.

"And it's a big boost for Bay, which had been lacking in configuration management," he said.

The BayStack 301 Desktop Ethernet switch includes 22 switched Ethernet ports and two switched Fast Ethernet ports. It costs $4,795.

The Fast Ethernet modules for the System 3000 range in price from $1,995 to $2,495.

The switch and modules are available now; the module for the System 5000 will ship next year.

Computerworld has learned that Bay also will announce the Bay-Stack Token Ring Hub, a 24-port hub for its BayStack line of stackable networking products.

The hub will be available with many levels of management capability. Pricing will range from $2,795 to $6,495.

Bay also will announce that its Centillion 100 LAN switch will be integrated in its Optivity line of management packages by January, said sources briefed by the company.

Lightweight ATM analyzer is introduced

By Patrick Dryden

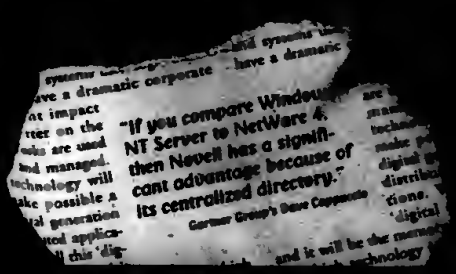
Net2Net Corp. last week launched a portable ATM analyzer that is small and inexpensive enough to deploy throughout an organization that needs to build and maintain cell-switching Asynchronous Transfer Mode (ATM) connections.

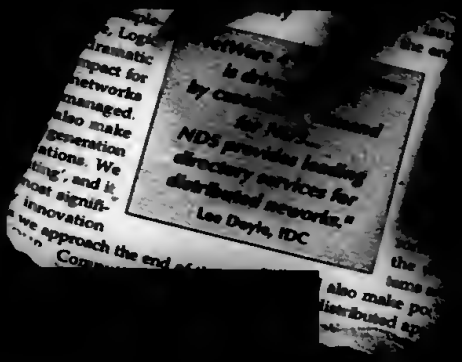
CellBlaster LT is 1.5 in. thick, weighs four pounds and connects to an Intel Corp. Pentium-class laptop. It costs $19,995.

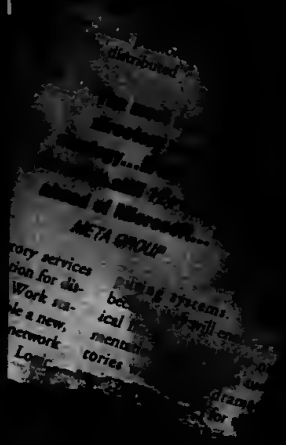
The Hudson, Mass., vendor entered the market a year ago with a luggable version that cost $35,000. The first ATM analyzer from Hewlett-Packard Co. was the size of a file cabinet and cost more than $100,000. But network managers said they need a dual-purpose analyzer that they can assign to field-service technicians and install as a remote monitor.

Net2Net's CellBlaster LT *weighs just 4 pounds*

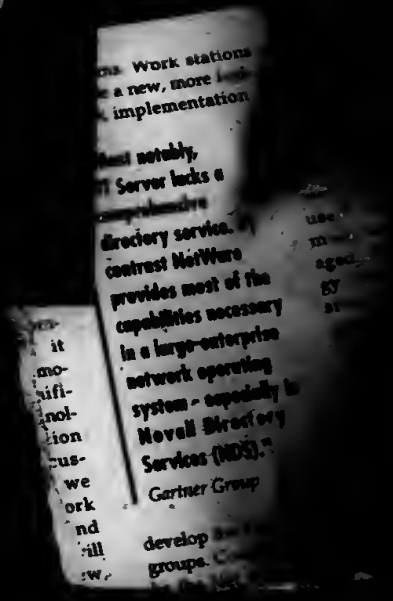
CellBlaster LT connects to a laptop or ATM switch by Ethernet for over-the-network management. Or it can be monitored outside the network via modem or Integrated Services Digital Network connection. From a Windows NT or Windows 95 console, operators can capture cells at the full speed of a 155M bit/sec. ATM circuit.

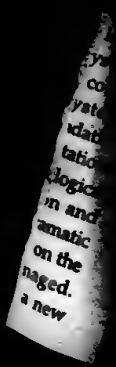

"If you compare Windows NT Server to NetWare 4, then Novell has a significant advantage because of its centralized directory."
Gartner Group's Dave Cappuccio

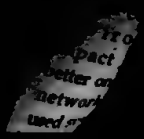




Okay, So Novell Found A Few Analysts Who Share Its Vision.







Utilities aim at phone business

Electricity providers enter the fray in bids to offer telecommunications services

By Kim Girard

Deregulation

Electric utilities across the nation — flush with extra network capacity and rights-of-way for fiber cables — are joining the rush to capture telecommunications customers in the deregulated market.

The latest utility entry is Boston Edison Co., which recently announced an alliance with cable and telecommunications firm RCN, Inc. to offer bundled voice, data and Internet services.

Elsewhere, Entergy Services, Inc., a utility in Gretna, La., plans to offer telecommunications services. And Northeast Utilities in Hartford, Conn., and Central Maine Power Co. in Augusta, Maine, have formed subsidiaries to invest in FiveCom, Inc., which is building a fiber-optic network in New England.

Boston Edison boasts 200 miles of fiber-optic cable for communications between its power plant and transmission stations. RCN will use that bandwidth to provide bundled services that customers can order on one bill.

The venture initially will target multifamily dwellings, but Boston Edison officials expect to soon add business users to the target market.

The Boston Edison/RCN venture is building a $300 million data network to offer customers an array of services, including cable television, Internet access and local and long-distance phone services. Customers eventually will be able to use the network to order electricity and monitor home security and heating/cooling systems.

New faces

But Chris Landes, a mobile and enhanced services consultant at TeleChoice, Inc. in Verona, N.J., questioned whether utilities have enough name recognition to compete with traditional carriers, which themselves are being forced to compete more aggressively.

Utilities such as Boston Edison will need to break free from their slow-moving bureaucracies and find a savvy partner to avoid culture shock in the networking market, analysts said.

One user said he doubted his company would switch to a utility for networking services, even though he is dissatisfied with traditional carrier Nynex Corp.

"I haven't looked at [a utility] yet," said Andrew Stratford, a vice president at Congress Financial Corp. in New York.

"The conservatism of the banking industry would make it very difficult for me to go to an alternate carrier," he said.

LEGAL NOTICE
U.S. POSTAL SERVICE
STATEMENT OF OWNERSHIP, MANAGEMENT and CIRCULATION
(Required by 39 U.S.C. 3685)

1. Title of Publication: Computerworld
2. Publication No.: 00104841
3. Date of filing: October 1, 1996
4. Frequency of issue: weekly, with a single combined issue the last two weeks in December
5. Number of issues published annually: 51
6. Annual subscription price: $49.00
7. Location of known office of publication: 500 Old Connecticut Path, Framingham, MA 01701-9171 (Middlesex County)
8. Location of the headquarters of general business offices of the publishers: 500 Old Connecticut Path, Framingham, MA 01701-9171 (Middlesex County)
9. Names and addresses of the publisher, editor and executive editor: Publisher, Michael Rogers, 500 Old Connecticut Path, Framingham, MA 01701-9171; Editor-in-Chief, Paul Gillin, 500 Old Connecticut Path, Framingham, MA 01701-9171; Editor, MaryFran Johnson, 500 Old Connecticut Path, Framingham, MA 01701-9171
10. Owner: International Data Group, Penthouse, 1 Exeter Plaza, Boston, MA 02116-2851
11. Known bondholders, mortgages and other security holders owning or holding 1% or more of total amount of bonds, mortgages or other securities: International Data Group, Penthouse, 1 Exeter Plaza, Boston, MA 02116-2851
12. For completion by nonprofit organizations authorized to mail at special rates: Not applicable.
13. Publication Name: COMPUTERWORLD
14. Issue date for circulation data below: September 1, 1996
15. Extent and nature of circulation:

	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total number of copies printed (net press run)	198,284	194,685
B. Paid and/or requested circulation		
1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail subscriptions (paid and/or requested)	170,375	178,905
C. Total paid and/or requested circulation	170,375	178,905
D. Free distribution by mail, carrier or other means, samples, complimentary and other free copies	25,237	13,853
E. Free distribution outside the mail, carriers or other means	None	None
F. Total distribution (Sum of D and E)	25,237	13,853
G. Total distribution (Sum of C and F)	195,612	192,758
H. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	2,673	1,927
2. Returns from news agents	None	None
I. Total (Sum of G, H1 and 2 – should equal net press run shown in A)	198,285	194,685
Percent paid and/or requested circulation (15C/15G x 100)	87.10%	92.81%

I certify that the statements made by me above are correct and complete.

Pat Walker
Traffic Manager

New Products

ADC Kentrox has announced MagnumPlus, a broadband access multiplexer.

According to the Portland, Ore., company, MagnumPlus integrates and transports voice, video and data onto T3/E3 or OC-3 public and private backbones. It was designed for 10M bit/sec. throughput.

Pricing starts at $10,000.

▶ *ADC Kentrox*
(503) 643-1681
www.kentrox.com

ChatCom, Inc. has announced a family of enterprise servers, the ChatterBox Corporate Series and Office Series.

According to the Chatsworth, Calif., company, one platform consolidates many Intel Corp.-based CPUs within a single rack-mounted enclosure to enhance maintenance and scalability.

Pricing starts at $1,460 for an Office Series Model 204.

▶ *Chatcom*
(818) 709-1778
www.jlchatcom.com

Citadel Computer Systems, Inc. has released NetOff 5, an automatic log-off software program.

According to the Houston company, NetOff 5 saves unattended open files in 32- and 16-bit applications before automatically logging off. It prevents unauthorized access to workstations and corrupt backups caused by open files. It monitors a communications port and treats the carrier tone or data transfer as activity.

NetOff 5 has an Instant Logoff feature that lets users log off the system by clicking an icon.

It can also be configured by a network administrator to automatically close an individual workstation, a group of workstations or the entire system.

NetOff 5 costs $499. It requires Novell, Inc.'s NetWare 3.x or NetWare 4.x or Microsoft Corp.'s Windows 3.1, Windows 95 or Windows NT.

▶ *Citadel Computer Systems*
(713) 686-6400
www.citadel.com

Sourcecom Corp. has delivered Banc 6000 DSlam-Plus, a LAN/WAN frame and cell switching and routing access platform.

According to the Westlake Village, Calif., company, the platform allows construction of Digital Subscriber Line-based public broadband access networks.

The Banc 6000 base unit with 32 WAN ports is priced at $19,950. The DSlam-Plus firmware costs $950.

▶ *Sourcecom*
(818) 735-3500
www.sourcecom.com

Racal-Datacom, Inc. has announced the TrustMe Authentication Server to provide secure access control for the corporate LAN or enterprise network.

According to the Sunrise, Fla., company, the server uses tokens that support Radius and Tacacs authentication, authorization and accounting services.

Pricing starts at $1,695 for software and a license for 50 users.

▶ *Racal-Datacom*
(954) 846-1601
www.racal.com

Xylan Corp. has announced OmniSwitch and PizzaSwitch, LAN switches that offer frame-relay access.

According to the Calabasas, Calif., company, the products allow enterprise connections from major campuses to regional offices, especially those that need higher-performance servers where the LAN switch replaces the hub and the router.

Pricing starts at $5,500.

▶ *Xylan Corp.*
www.xylan.com

Larscom, Inc. has announced the IMUX-A45, an Asynchronous Transfer Mode (ATM) Imux Module for the Orion 4000 Broadband Access Multiplexer.

According to the Santa Clara, Calif., company, the module allows network users and others to inverse multiplex ATM cells over standard T1 lines bit by bit to create a clear channel for ATM traffic.

Pricing starts at $11,950.

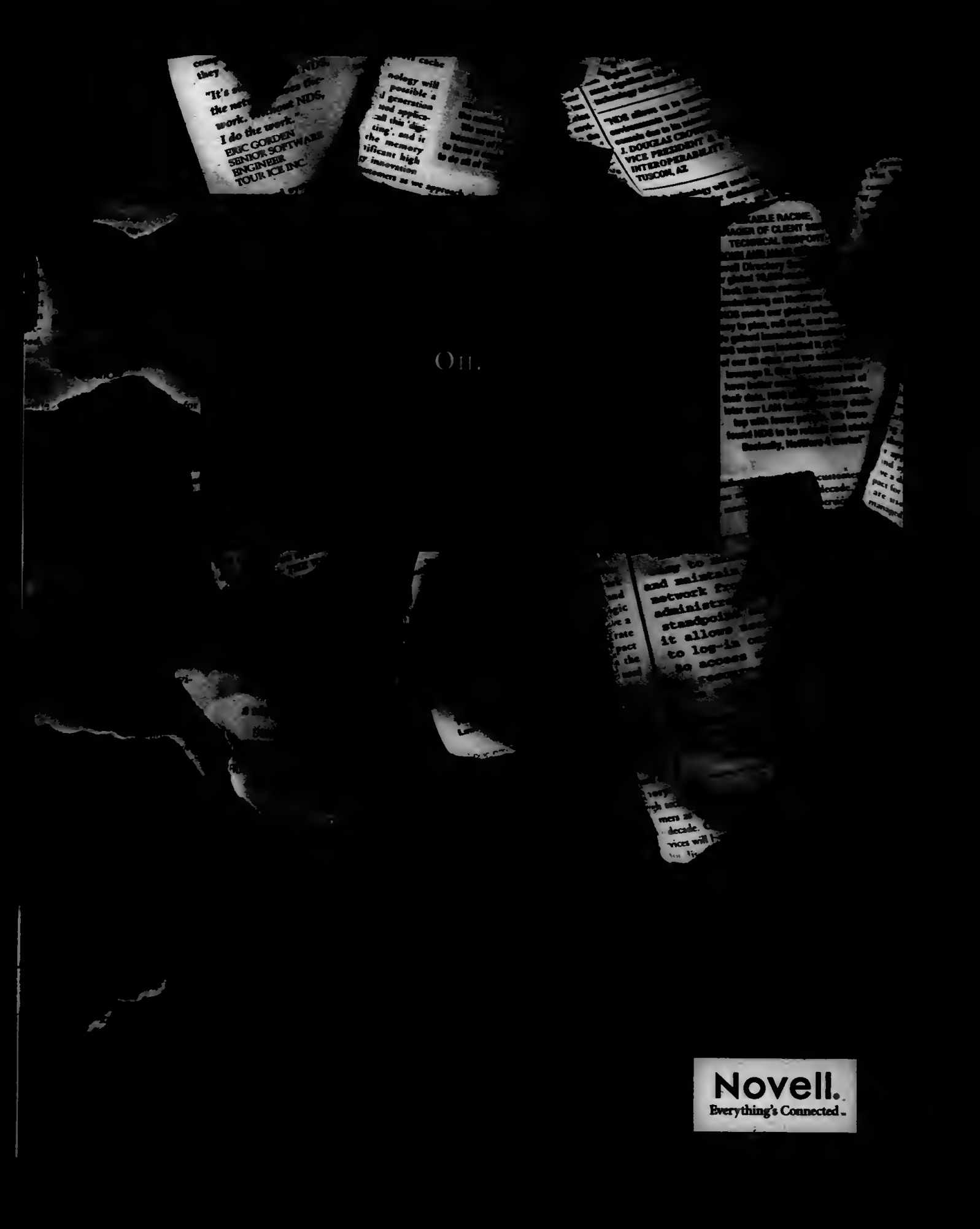
▶ *Larscom*
(408) 988-6600
www.larscom.com

Verity, Inc. has announced Search'97, a family of products for deploying search applications across an enterprise.

According to the San Francisco company, Search'97 integrates a search engine with intelligent search components. Search'97 Personal works with an information and agent server.

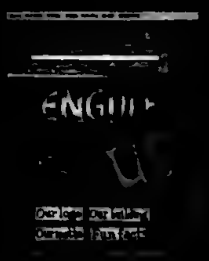
Pricing starts at $1,995 per server for enterprisewide deployment.

▶ *Verity*
(408) 541-1500
www.verity.com


"It's
the net
work.
I do the work."
ERIC GORDEN
SENIOR SOFTWARE
ENGINEER
TOUR ICE INC.
J. DOUGLAS CROW
VICE PRESIDENT &
INTEROPERABILITY
TUSCON, AZ
and maintain
network fr
administr
standpoi
it allows
to log-in
to access
Novell.
Everything's Connected.

YOUR CAREER IS RESULTS-ORIENTED.

YOUR COMPANY IS RESULTS-ORIENTED.



YOUR WEBSITE IS...UH OH.

Your website should be more than just an electronic bulletin board. It should be a real place where you can conduct real business.

Enter: Domino™ from Lotus. Domino is the only true interactive web application server that helps your business get the most out of the web.

While it delivers corporate product and marketing information like Microsoft's® or Netscape's® web servers, only Domino helps your customers find the information they want quickly with site-sort-on-the-fly features.

And it makes interacting with employees, customers and suppliers a snap with application templates to register site visitors and set up threaded discussions.

Yet its benefits don't stop there. Domino is also secure so you have flexibility over who sees what.

It automates workflow processes like lead generation, resume tracking and customer service—so you can act on information, not just read it.

Best of all, Domino is built on the world's most powerful platform for business applications: Lotus Notes.®

Domino. It's all business. For more information, please visit our website at http://domino.lotus.com.

Lotus
Working Together™

For more information, call 1-800-465-7999, ext. 6000. ©1996 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. Lotus Notes and Working Together are registered trademarks and Notes is a trademark of Lotus Development Corporation. All company names are registered trademarks of their respective companies.

INTRODUCING SUITESPOT. THE FULL-SERVICE INTRANET THAT PICKS UP WHERE OTHERS LEAVE OFF.

WHAT IS SUITESPOT?

Picture an intranet that's running at full potential. That's new Netscape SuiteSpot,™ the only integrated suite of server software that lets you build a Full-Service Intranet. With SuiteSpot, you can build network productivity applications that help you communicate, collaborate, and share information. Choose any combination of our five different software products: Netscape Enterprise, Mail, News, Proxy, or Catalog Servers. SuiteSpot also comes with our application development and data access tool, LiveWire Pro.™

Standards-Based Mail, Messaging & Discussion Apps	Yes	No	No
Standards-Based Distributed Search & Indexing	Yes	No	Only Views Replication
Server-Based Java & Javascript	Yes	No	No
Native Support For Oracle, Sybase, Informix, & ODBC	Yes	ODBC Only	ODBC Only
Cost w/1,000 Clients	$36,900	$182,018	$72,590

SUITESPOT VERSUS ALTERNATIVE SYSTEMS

Unlike older technology, only SuiteSpot's open-server product family allows you to build one architecture for Internet and intranet applications – one architecture that's cheaper and easier to maintain. And SuiteSpot easily integrates with current client/server applications running on Unix and Windows NT.

To learn more about SuiteSpot and the Full-Service Intranet, call for your free white paper, "The Netscape Intranet Vision," at 1-800-397-8680.

NETSCAPE

©1996 Netscape Communications Corporation. All other trademarks are property of their respective owners. Prices are subject to change.

Notes-based program may facilitate long-distance training, 76

The Internet

Playbill webmaster trades footlights for 'net sites

By Mitch Wagner

Andy McGibbon is hardly the first small-town boy to become a big star on Broadway. But McGibbon's name isn't in the bright lights of the Great White Way — it's on the brightly lit pixels of the information highway.

McGibbon came to New York City 14 years ago, a teen-ager from upstate New York with a few years of acting training under his belt and a hankering to be a star. Now the 32-year-old is webmaster at Playbill Online (www.playbill.com), a World Wide Web site devoted to promoting live theater and selling theater tickets worldwide.

The transition from theater pro to webmaster came quickly to McGibbon. In December 1994, when looking for a career change after years of working backstage on Broadway, McGibbon bought a book about the Web. Soon, he created his own site. By last February, he had a job at Playbill.

"It was a whole new career for me — in five weeks and 800 pages," McGibbon said.

McGibbon may have succeeded as soon as he hit the Web, but it was only after he gave up his dreams of being a star on Broadway. "I basically could see there were too many people in the industry who wanted it more than I wanted it," he said. "To succeed in this business, it's got to be the only thing in life that you want."

So McGibbon worked behind the scenes as a stage manager and theater general manager. That lasted for more than a decade, but eventually McGibbon grew tired of the long hours and unreliable workload of theater life. He took a job as a legal secretary in 1994 and tried to figure out what he wanted to do with the rest of his life.

Around that time, the Internet and online services ceased to be the exclusive preserve of computer professionals and hobbyists and instead became popular among regular people. McGibbon got an Internet account. Later, he bought the only Internet book he could find in a Barnes & Noble bookstore in midtown Manhattan. He learned enough Hypertext Markup Language from the book to put up his own Web site, devoted to — what else? — the theater.

The site got rave reviews, and McGibbon was offered a job directing [illegible] site, which has a daily [illegible] of news about the theater business and offers tickets and information about listings in 3,000 theaters nationwide.

McGibbon said he hopes to expand the site to include seating charts and possibly use the Virtual Reality Modeling Language to help theatergoers choose their seats.

Profile: Andy McGibbon

Scotia spreads stock information more quickly via intranet

By Kim S. Nash

Nowhere but in the stock market is time so much equated with money.

Slicing a day off the process for distributing expert stock opinions to investors can mean more money all around; stock buyers could see more profits, and brokers could see more commissions.

Scotia Capital Markets did just that this past summer. The Toronto-based investment firm built a 2,500-user intranet that analysts across Canada use to continuously update their stock evaluations based on news and market movements throughout the day. Reports are available immediately to brokers, traders and other salespeople who buy and sell shares and other investment services.

Scotia's Diane Urquhart *says intranets are vital to the investment firm*

Employees can access this research almost as quickly as analysts write it, rather than having to wait for updates or hard-copy reports.

Previously, Scotia Capital used a 10-year-old, proprietary application that, at best, allowed for only once-daily updates and then only to some employees. Others had to wait for printouts.

The old system "met all the regulatory requirements, but it wasn't accessible to everyone and didn't do a lot of what we now want," said Diane Urquhart, managing director of equity research.

For example, research reports previously couldn't include detailed graphics or the use of color.

Risky rollout

Scotia Capital's effort wasn't your typical first-timer intranet application.

Most companies tend to start with simpler stuff, such as telephone directories, newsletters or human resources applications. These are generally static lists of data that end users can scan or search.

But Scotia Capital's intranet handles data that is key to the business.

"In a cereal company, intranets often just provide goings-on inside the company and other simple things like that. But this is vital to us," Urquhart said.

Scotia was smart to tackle this kind of project, said Walid Mougayar, president of CyberManagement, Inc., a consulting firm in Toronto.

"They will see more return on investment because this is an area that affects customers and revenues right away," Mougayar said.

Scotia Capital's intranet costs weren't high, said Gail Smith, vice president of front-office development at the investment firm.

This is partly because rebuilding the analyst report application was a separate project from the intranet work.

Also, the company already had a TCP/IP wide-area network and a few thousand PCs and Unix workstations in place. Smith declined to specify the final cost but said the only outlay was for Net-

Scotia, *page 76*

Notes based program may facilitate long distance training, 76

The Internet

Playbill webmaster trades footlights for 'net sites

By Mitch Wagner

Andy McGibbon is hardly the first small-town boy to become a big star on Broadway. But McGibbon's name isn't in the bright lights of the Great White Way — it's on the brightly lit pixels of the information highway.

McGibbon came to New York City 14 years ago, a teen-ager from upstate New York with a few years of acting training under his belt and a hankering to be a star. Now the 32-year-old is webmaster at Playbill Online (www.playbill.com), a World Wide Web site devoted to promoting live theater and selling theater tickets worldwide.

The transition from theater pro to webmaster came quickly to McGibbon. In December 1994, when looking for a career change after years of working backstage on Broadway, McGibbon bought a book about the Web. Soon, he created his own site. By last February, he had a job at Playbill.

"It was a whole new career for me — in five weeks and 800 pages," McGibbon said.

McGibbon may have succeeded as soon as he hit the Web, but it was only after he gave up his dreams of being a star on Broadway. "I basically could see there were too many people in the industry who wanted it more than I wanted it," he said. "To succeed in this business, it's got to be the only thing in life that you want."

So McGibbon worked behind the scenes as a stage manager and theater general manager. That lasted for more than a decade, but eventually McGibbon grew tired of the long hours and unreliable workload of theater life. He took a job as a legal secretary in 1994 and tried to figure out what he wanted to do with the rest of his life.

Around that time, the Internet and online services ceased to be the exclusive preserve of computer professionals and hobbyists and instead became popular among regular people. McGibbon got an Internet account. Later, he bought the only Internet book he could find in a Barnes & Noble bookstore in midtown Manhattan. He learned enough Hypertext Markup Language from the book to put up his own Web site, devoted to — what else? — the theater.

The site got rave reviews. Soon, McGibbon was offered a job directing *Playbill*'s site, which has a daily live feed of news about the theater business and offers tickets and information about listings in 3,000 theaters nationwide.

McGibbon said he hopes to expand the site to include seating charts and possibly use the Virtual Reality Modeling Language to help theatergoers choose their seats.

Scotia spreads stock information more quickly via intranet

By Kim S. Nash

Nowhere but in the stock market is time so much equated with money.

Slicing a day off the process for distributing expert stock opinions to investors can mean more money all around; stock buyers could see more profits, and brokers could see more commissions.

Scotia's Diane Urquhart *says intranets are vital to the investment firm*

Scotia Capital Markets did just that this past summer. The Toronto-based investment firm built a 2,500-user intranet that analysts across Canada use to continuously update their stock evaluations based on news and market movements throughout the day. Reports are available immediately to brokers, traders and other salespeople who buy and sell shares and other investment services.

Employees can access this research almost as quickly as analysts write it, rather than having to wait for updates or hard-copy reports.

Previously, Scotia Capital used a 10-year-old, proprietary application that, at best, allowed for only once-daily updates and then only to some employees. Others had to wait for printouts.

The old system "met all the regulatory requirements, but it wasn't accessible to everyone and didn't do a lot of what we now want," said Diane Urquhart, managing director of equity research.

For example, research reports previously couldn't include detailed graphics or the use of color.

Risky rollout

Scotia Capital's effort wasn't your typical first-timer intranet application.

Most companies tend to start with simpler stuff, such as telephone directories, newsletters or human resources applications. These are generally static lists of data that end users can scan or search.

But Scotia Capital's intranet handles data that is key to the business.

"In a cereal company, intranets often just provide goings-on inside the company and other simple things like that. But this is vital to us," Urquhart said.

Scotia was smart to tackle this kind of project, said Walid Mougayar, president of CyberManagement, Inc., a consulting firm in Toronto.

"They will see more return on investment because this is an area that affects customers and revenues right away," Mougayar said.

Scotia Capital's intranet costs weren't high, said Gail Smith, vice president of front-office development at the investment firm.

This is partly because rebuilding the analyst report application was a separate project from the intranet work.

Also, the company already had a TCP/IP wide-area network and a few thousand PCs and Unix workstations in place. Smith declined to specify the final cost but said the only outlay was for Net-

Scotia, *page 76*

Companies who have selected Open Market to help them lead the way in Internet Commerce

Bank One

•

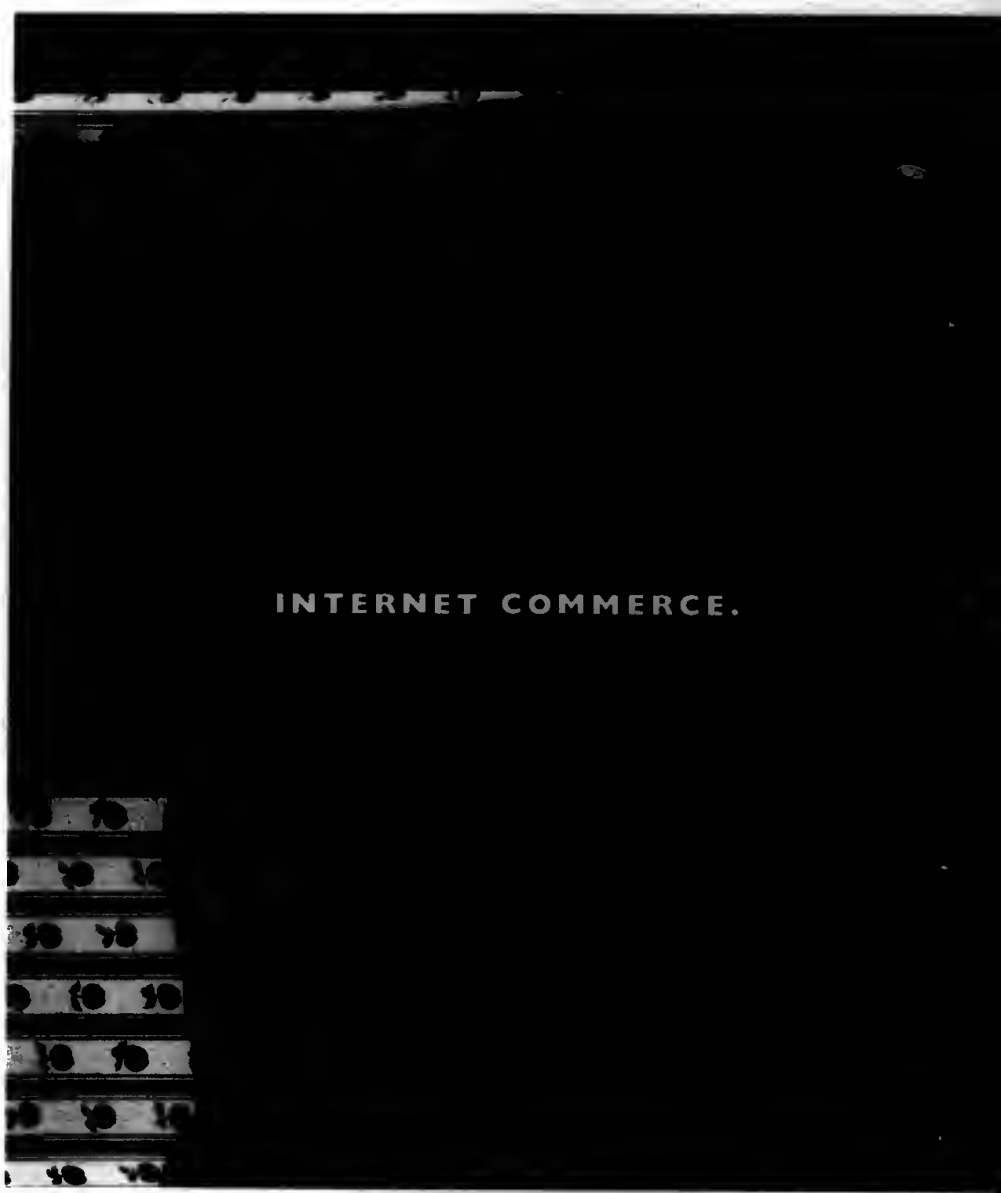
First Union National Bank

•

Time Warner's Pathfinder

•

Tribune Company



Copyright © 1996 Open Market, Inc All rights reserved.

WHY IS OPEN MARKET THE ONLY COMPANY THAT HAS TAKEN THE WRINKLES OUT OF INTERNET COMMERCE? OUR GOAL FROM DAY ONE WAS TO DEVELOP COMMERCE SOFTWARE FOR THE INTERNET. AND UNLIKE OTHER COMPANIES, OUR SOFTWARE IS AVAILABLE TODAY. IN FACT, SOME OF THE WORLD'S MOST SUCCESSFUL COMPANIES ARE ALREADY USING OUR SECURE, SCALABLE INTERNET COMMERCE SOLUTIONS TO DO BUSINESS WITH OTHER COMPANIES AND CONSUMERS. WITH THESE SOLUTIONS, LARGER COMPANIES CAN MANAGE NOT ONLY PAYMENT PROCESSING BUT EVERY ASPECT OF INTERNET BUSINESS TRANSACTIONS. AND SMALLER COMPANIES CAN REAP THE BENEFITS OF INTERNET COMMERCE WHILE OUTSOURCING THE COMPLEXITY, ALLOWING THEM TO FOCUS ON WHAT THEY DO BEST. IN SHORT, OPEN MARKET FITS YOUR NEEDS NO MATTER WHAT SIZE YOU ARE.

TO IRON OUT YOUR OWN INTERNET COMMERCE SOLUTION, VISIT OUR WEBSITE AT WWW.OPENMARKET.COM/WRINKLE. OR CALL 1-888-OPEN-MKT.

Open Market
245 First Street
Cambridge, MA 02142

OPEN MARKET

We **ARE** *Internet Commerce.*

Encryption confusion

Gary H. Anthes

"Clinton ends bitter fight over encryption" — *The Washington Post*, Oct. 1.

"White House plan spurns computer industry" — *San Jose Mercury News*, Oct. 1.

What we have here is a failure to communicate.

Those contradictory headlines refer to the recent White House announcement that it would relax controls on the export of encryption products.

The federal fracas over encryption began in 1994 when the Clinton administration unveiled an idea so breathtakingly flawed that the White House has yet to recover, despite having made major concessions for which it gets little credit.

Remember the Clipper chip? It was intended to offer users unbreakable encryption while preserving the ability of law enforcers to wiretap the coded conversations of criminals and terrorists.

Clipper was hardware — strike one. It used a secret algorithm known only to the National Security Agency — strike two. It required users to give their secret encryption keys to the federal government — strike three. Clipper was out.

But Uncle Sam is nothing if not persistent. The administration's idea has evolved into software-based encryption that uses standard industry algorithms with user-selected third parties — or even users' companies — holding the keys.

Through three iterations, the administration has moved a long way toward meeting the criticisms of users and privacy advocates. Calling this "Clipper III," as some of its critics do, is like comparing a Ferrari with a Model T.

The debate over the concept of government as code-cracker hasn't been helped by the failure of law enforcement to make its case. I have attended any number of conferences on this topic at which no cop stood up — perhaps none was invited? — to warn us about the technologically empowered bad guys.

And speaking of failures to communicate, take IBM, which recently teamed with 10 companies to develop technology for a "key-recovery" system intended to satisfy the new export criteria.

Through some mysterious process, the scheme will allow the government to get encryption keys when it needs them, without having to hold them "in escrow" — the Clipper approach.

Why "mysterious?" IBM's press release announcing the initiative was four pages of self-congratulatory drivel with almost no information about what the companies would develop or how it would work.

Reminded of the secret Clipper algorithm, I sought details from IBM. I asked a spokeswoman why the company hadn't just put out a nice, snappy white paper explaining its new approach to key recovery.

"We spent three months trying to do that, quite literally," the spokeswoman said. "It's pretty confusing stuff, and whenever we get it on paper, we aren't happy with it."

We aren't off to a good start on this latest idea for reconciling the interests of users and law enforcers.

Anthes is *Computerworld*'s senior editor of government and security.

Scotia

CONTINUED FROM PAGE 73

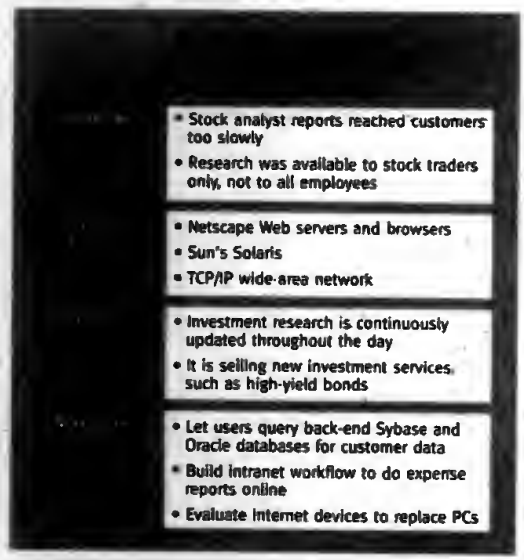
scape Communications Corp. software. Netscape's SuiteSpot server bundle is $3,995; its browser costs about $79 for a single copy.

Future intranet plans include building workflow applications, such as expense forms and purchase orders. Also on Scotia Capital's list of technologies to try are Internet devices or slim PC-like machines for Web surfing.

In theory, maintenance costs for the devices would be lower than for PCs, Smith said. But at least one roadblock must be removed before the firm will use them: a lack of traditional desktop applications.

Internet device proponents say word processors and other packages will be replaced by Web-based alternatives, but it hasn't happened yet.

"And no matter what else users have on their PCs, word processing is what they need," Smith said.


• Stock analyst reports reached customers too slowly
• Research was available to stock traders only, not to all employees
• Netscape Web servers and browsers
• Sun's Solaris
• TCP/IP wide-area network
• Investment research is continuously updated throughout the day
• It is selling new investment services, such as high-yield bonds
• Let users query back-end Sybase and Oracle databases for customer data
• Build intranet workflow to do expense reports online
• Evaluate Internet devices to replace PCs

Notes-based program may facilitate remote training

By Tim Ouellette

Corporate trainers soon may get a breather from tight budget resources, thanks to a new Notes-based distance-learning program from Lotus Development Corp.

Cambridge, Mass.-based Lotus last week announced LearningSpace, a set of Notes databases that lets companies create distance-learning courses based on the Notes groupware environment.

Online courses

But user companies don't have to fully commit to Notes to use LearningSpace. Course developers currently need Notes clients to build courses, but users can get to third-party training courses via any Web browser. The product runs on Domino, Lotus' World Wide Web and Notes server.

A new version due next year will let course developers do everything from a Web browser without having to buy Notes clients.

Developers would license the LearningSpace server-based databases, but they could make courses available to users via Web browsers.

Cost savings

More important to the bottom line, a distributed, group-training environment lets companies cut costs by creating course work and group discussions without having to rent classrooms, pay for travel or force students into a specific time frame for learning.

"It really is just-in-time training when employees want [it], not when we give it to them," said John Burrows, assistant to the vice chairman at Buckman Laboratory International, a global chemical firm in Memphis.

"It also levels the playing field for training for our worldwide sales staff," he said.

Currently, Buckman employees may receive different types of training, depending on their location.

Buckman has only a small group of users in finance departments who now run Notes.

The company will create a training program that will provide consistency across its global sales offices and help absorb the best sales techniques from across the company.

LearningSpace is made up of five Notes databases — Schedule, MediaCenter, CourseRoom, Profiles and Assessment Manager — that can reside on an in-house Notes server or on one of many Notes public networks.

In fact, Lotus is working with online Notes providers such as the IBM Global Network and US West Communications, Inc. to offer LearningSpace hosting services.

LearningSpace guides trainers through course creation without them having to know anything about Notes programming.

For example, a trainer can create course syllabi, tests and study groups and then post reading materials and videos for students to access, read and discuss.

The system is different from traditional computer-based training (CBT) because it opens up discussion and learning to many participants.

It isn't limited to a particular time frame and can include small CBT modules in Notes format or other formats as part of a larger LearningSpace course.

Graduate classes

Companies such as Buckman could also use it to let employees enroll in graduate or continuing education programs at outside universities.

"They want to access the education they need at times and places that are convenient to them, while still having communications with other students and faculty," said Donald E. Hanna, chancellor at the University of Wisconsin-Extension in Madison.

The school is developing an executive MBA program based on LearningSpace in which workers can pursue course work with a Web browser in their home.

The LearningSpace Starter-Pack will be available next month. It will cost $3,500 and come with a single course developer license and a license to deliver courses to 50 participants at a time.

Larger licenses will also be available.

NFS

for Windows NT 4.0

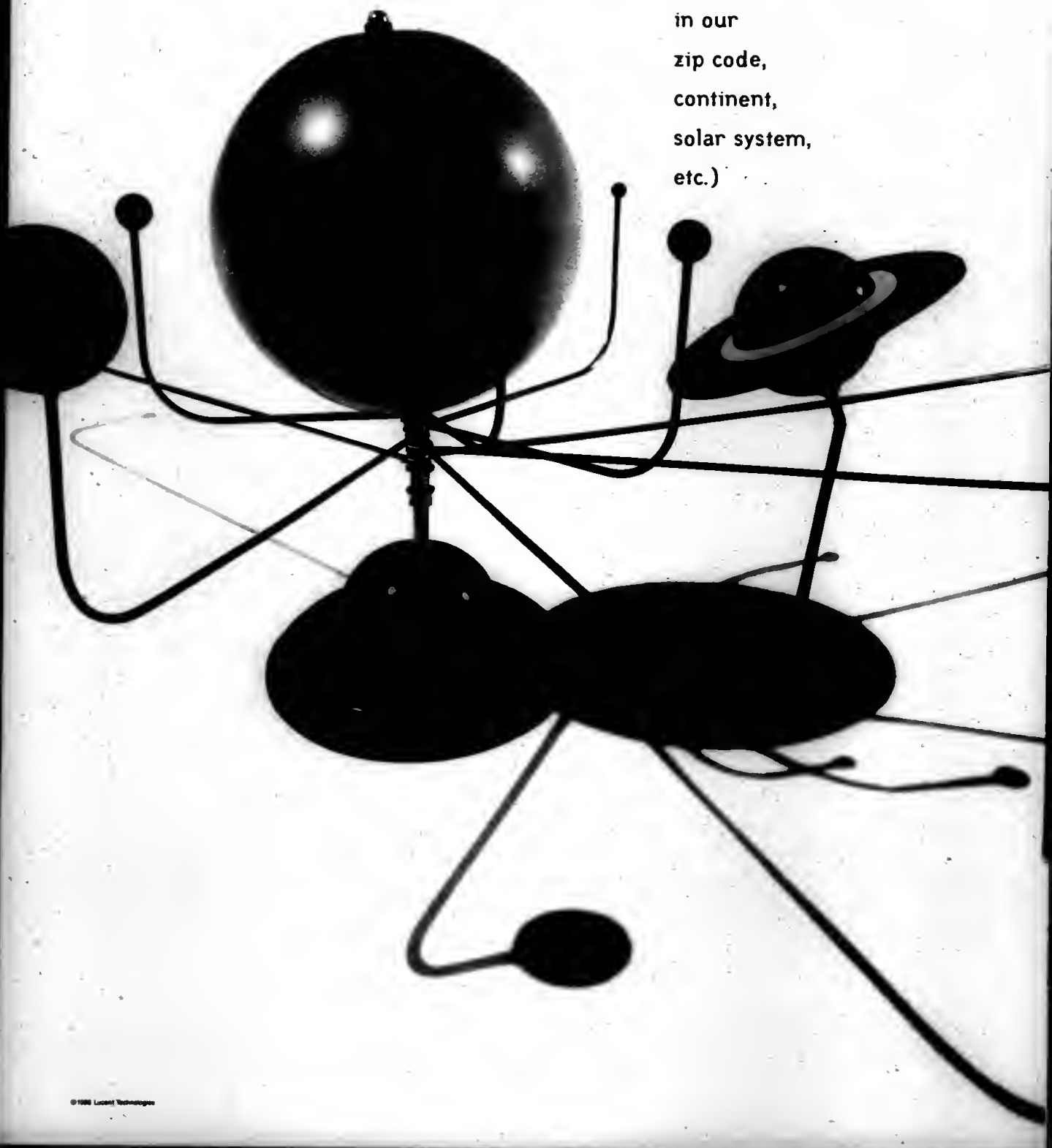
Today!

NETMANAGE®

1.408.342.7525

first on our block.

(also first
in our
zip code,
continent,
solar system,
etc.)



©1998 Lucent Technologies

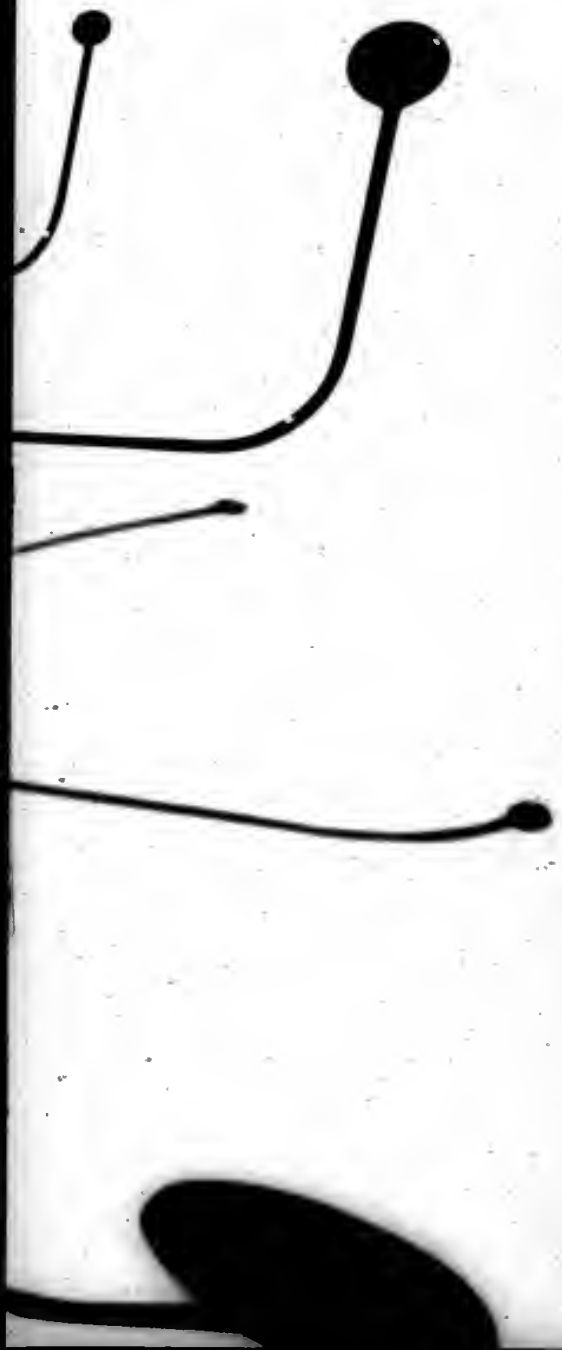
Now available:

- L first multimedia conferencing system that brings together people on different communications devices (e.g., groups on workstations in N.Y. and L.A. can meet with a lucky dog on a cell phone in Aspen). Named Multimedia Communications eXchange or MMCX, for short.

L first software that creates "universal mailbox" using customers' existing servers. Makes e-mail, voice mail, faxes available from any phone or desktop pc. (Letters from Mom still come old-fashioned way.) Ask for INTUITY™ AUDIX Integrated Messaging.

L first videoconferencing system with continuous presence, switching among up to 24 sites. (Nearly five times more than other guys' system.) Four sites on screen simultaneously. Named Multipoint Conferencing Unit.

More good ideas where those came from (Bell Labs). Call former Business Communications Systems division of AT&T. Now Lucent Technologies.



Lucent Technologies
Bell Labs Innovations
211 Mt. Airy Road
Basking Ridge, NJ 07920
www.lucent.com/BusinessWorks
1 800 325-7466 ext. 955

We make the things that make communications work.™

New Products

IT Design USA, Inc. has announced Viper Instant-Access with WebLink, an Internet plug-in for companies that are migrating to an intranet environment.

The Cupertino, Calif., company said the WebLink enhancement allows corporate list-based information to be delivered to every network desktop using Netscape Communications Corp.'s Navigator or Microsoft Corp.'s Internet Explorer browsers.

Pricing for the plug-in and three software packages starts at $11 per user for systems of 5,000 or more users.

▶ *IT Design USA*
(408) 342-0435
www.itdesign.com

Intermind Corp. has released Intermind Communicator, software that allows World Wide Web users to send and receive only content of mutual interest and still retain anonymity.

The Seattle company said the publishing, subscribing and anonymous feedback system runs over any Web server or network.

Pricing for Intermind Communicator starts at $195.

▶ *Intermind*
(206) 812-6000
www.intermind.com

LearnKey, Inc. recently released a training series, World Wide Web Page Development Video Guide.

According to the St. George, Utah, company, the guide is a three-course videotape. It offers instructions on how to create Web pages with Adobe Systems, Inc.'s PageMill and Hypertext Markup Language.

The guide costs $49.95 per course or $129 for all three.

▶ *LearnKey*
(801) 674-9733
www.learnkey.com

DeltaPoint, Inc. has introduced QuickSite Developer's Edition, a World Wide Web site creation and management tool.

According to the Monterey, Calif., company, QuickSite Developer's Edition gives Web developers full control over Hypertext Markup Language. The product has 65 features for Web developers, including 3D Web Site Builder, a visual Virtual Reality Modeling Language creation tool.

QuickSite Developer's Edition costs $295.

▶ *DeltaPoint*
(408) 648-4000
www.deltapoint.com

Around Technology, Inc. has announced DataHouse CD Port TopSpin, CD-ROM towers to provide embedded World Wide Web servers with support for Web browsers and servers.

According to the Cleveland company, the products permit direct network connection of SCSI CD-ROM drivers to Ethernet or 10Base-T networks.

Pricing for CD Port TopSpin starts at $2,619.

▶ *Around Technology*
(216) 234-6400
www.aroundtech.com

Integrix, Inc. has announced NS200, an UltraSPARC-based server for enterprises with World Wide Web-based networks.

The Newbury Park, Calif., company said the NS200 is the first in a series. It provides a wide range of server solutions in standalone or rack-mounted configurations.

Pricing for NS200 starts at $27,500.

▶ *Integrix*
(805) 376-1001
www.integrix.com

FiTech, Inc. has announced NetBankPC, software that allows online banking in a secure environment.

The Heathrow, Fla., firm said the software is suitable for small to midsize banks and allows Internet access for customers regardless of PC make or model.

Pricing for NetBankPC starts at $35,000.

▶ *FiTech*
(407) 333-3723
www.mybank.com

PR-Consult has announced Biztrav International 4.0, a database application that expands upon earlier versions by adding the local access numbers of CompuServe and America Online.

According to officials at the San Diego company, Version 4.0 lets users go to the city data file and select CompuServe or America Online records to obtain the least-expensive access to travel information.

Biztrav International 4.0 costs $79.

▶ *PR-Consult*
(619) 625-4622
www.ourworld.compuserve.com/homepages/biztrav

Philips Electronics North America Corp. has announced two videoconferencing kits, EasyCam and EasyConnect, for Internet and LAN users.

The San Jose, Calif., company said both kits include the Philips EasyVideo capture board. EasyCam includes a high-resolution color camera, and EasyConnect can be used with all existing camcorders and analog desktop video cameras.

Pricing for EasyCam and EasyConnect is $499 and $299, respectively.

▶ *Philips Electronics*
(408) 453-5129
www.pps.philips.com

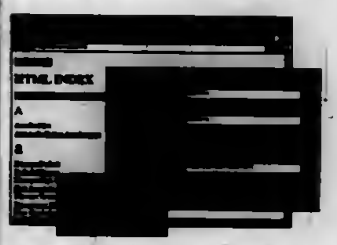
Network Engineering Technologies, Inc. has announced Telaxian Shield, a firewall system designed for secure business transactions on the Internet and intranets.

Officials at the San Jose, Calif., company said Telaxian Shield lets users build an enterprise system of firewalls to consolidate security.

Pricing starts at $7,995.

▶ *Network Engineering Technologies*
(408) 453-7500
www.firewalls.com

Blue Sky Software Corp. has announced Help-to-HTML 3.2, which converts Windows help files into World Wide Web sites.



Blue Sky's *Help-to-HTML 3.2 converts Windows help files into Web pages*

According to the La Jolla, Calif., company, Help-to-HTML Version 3.2 lets users convert Windows 3.1, Windows 95 and Windows NT help files into Web pages, graphics interchange format files and image map files with one mouse click.

Help-to-HTML Version 3.2 costs $199.

▶ *Blue Sky Software*
(619) 459-6365
www.blue-sky.com

Global Village Communication, Inc. has announced NewsCatcher, a wireless desktop receiver that can deliver instant, customizable news to Windows 95-based PCs.

According to the Sunnyvale, Calif., company, the product doesn't require a constant connection to the Internet because it pulls information from the airwaves. AirMedia Live multimedia software organizes and presents the information.

NewsCatcher costs $149. The price includes one year of PowerUp, a service package.

▶ *Global Village Communication*
(408) 523-2407
www.globalvillage.com

Enigma Information Retrieval Systems, Inc. has announced Insight 3.5, which lets users publish on the World Wide Web via a one-step Hypertext Markup Language conversion process.

According to the Wellesley, Mass., company, Insight 3.5 was designed for webmasters who have no programming knowledge.

Insight 3.5 costs $7,500.

▶ *Enigma Information Retrieval Systems*
(617) 239-8279

How do you really feel about technology?

It gives you power, it takes it away. It makes your life easier, it makes your life miserable. Of course you have mixed feelings about technology. You're only human.

But that's okay, because we can help. We can provide you with independent technology services that make sure the systems and networks working for you today don't work against you tomorrow. Centralized or decentralized. Mainframe or PC. All manufacturers.

No inflexible commitments. No power struggles. No dysfunction. No angst.

Just the ongoing feeling that technology is your friend, not your foe.

COMDISCO

A TECHNOLOGY SERVICES COMPANY

To learn more, visit www.comdisco.com or call 1-800-272-9792.

ASSET MANAGEMENT • DISASTER RECOVERY • NETWORK SERVICES • LEASING

Data Warehouse

FREE for a Limited Time...A CD ROM Preview of

The Top New Data Warehousing Software

When 200,000 IS managers were asked to choose the top software for data warehousing, their answer had a familiar ring:

SAS software from SAS Institute.

DATAMATION PRODUCT OF THE YEAR

As the only end-to-end solution for rapid data warehousing, SAS software delivers everything you need to manage, organize, and exploit your business data. The tools you use to build a data warehouse are the same ones used to maintain it...run it...and change it. And what's more, everything's scalable. You can jump right into enterprise-wide information delivery applications...or start small and build on your success.

SAS software doesn't consume overhead for database features you don't need. And once you have data in the warehouse, you'll find everything you need for data query and reporting, OLAP/multi-dimensional analysis, data mining, database marketing, data visualization, and much more. It's never been easier to access your data... or to arrive at informed decisions by turning raw data into real information.

SAS® **SAS Institute**

Software for Successful Decision Making

Phone 919.677.8200 Fax 919.677.4444
In Canada 1.800.363.8397

You can also request your free CD ROM, and learn more about SAS seminars in your area, by visiting us on the World Wide Web at http://www.sas.com/

E-mail: cw@sas.sas.com

SAS is a registered trademark of SAS Institute Inc. Copyright © 1996 by SAS Institute Inc.

Seminar Schedule

Atlanta	November 7	Montreal	November 5
Baltimore	November 13	Nashville	October 29
Boston	October 29	New York	October 31
Calgary	November 12	Orange County, CA	October 16
Charlotte	November 5	Orlando	October 30
Chicago	October 22	Philadelphia	November 12
Cleveland	November 6	Phoenix	November 19
Columbus	November 7	Portland	October 16
Dallas	October 24	Salt Lake City	November 13
Denver	November 14	San Diego	October 15
Detroit	October 24	San Francisco	October 17
Houston	October 23	Schaumburg, IL	November 8
Kansas City, MO	November 20	Seattle	October 17
Los Angeles	October 15	Stamford	October 22
Miami	November 6	Toronto	October 30
Minneapolis	October 23	Washington, D.C.	November 14

SEE A DEMONSTRATION OF EDM'S WINDOWS NT VERSION.

NOVADIGM

Attend the Only Seminar Focused Exclusively on Distributed Software Management

If your organization is deploying new client/server or internet software, this is one seminar you can't afford to miss. And it's free.

Plan to attend a half-day presentation from the industry leader in software management, Novadigm, and learn how you can eliminate the most time-consuming, error-prone, and costly task in your IT management environment—**managing distributed software.**

At this seminar, you'll see first hand how Novadigm's new patented 'desired-state' software management technologies enable organizations just like yours to control distributed software's 'millions of moving parts,' automatically:

- Configuring rapidly changing client/server applications across thousands of desktops and servers—without manual intervention.
- Securing and enabling new Intranet and Internet services for distributed employees, partners, and customers—reliably.
- Distributing shrink-wrap, operating system, and browser upgrades—'on-demand.'
- Integrating software management and network/systems management infrastructures—seamlessly.

This special invitation from Novadigm includes a sneak preview of a new release of its industry-standard EDM™ environment. It's a breakthrough that any IT professional would want to see ... and a must-attend event.

Register NOW. Call toll free 888.668.NOVA (6682) or visit www.novadigm.com.

Charles Schwab is creating a state-of-the-art stock quote system, 88

Corporate Strategies

Desktop video surge forecast

By Matt Hamblen

Sure, most desktop videoconferencing still has limitations — including jerky live video and a complicated setup.

Yet experts and users predict that business use of desktop videoconferencing will explode in the next two to four years, and they are warning information systems managers to be prepared.

The number of desktop videoconferencing units sold to businesses in 1994 totaled 30,000, but that will soar to 6 million in 2000, according to analyst Elliot Gold at Telespan Publications in Altadena, Calif.

Gold said that there will be an additional 14 million home videoconferencing units sold in 2000, a rapid growth partially fueled by the increasingly rich video and audio features on home PCs.

Gold's prediction of 20 million total units sold in 2000 could be low, said analyst Cheryl Currid, president of Currid & Co. in Houston. "This stuff is going to explode, and it's going to explode in the face of IS," she said.

Also contributing to the technology's growth are plummeting costs, improving quality and ease of use, and plans for nearly every PC sold for home or business use to soon have videoconferencing tools bundled in, according to analysts and vendors.

Compaq Computer Corp., for example, has begun bundling video and audio communications capabilities from Intel Corp. on the motherboard of its computers, and it won't be much longer before small desktop cameras are a standard part of most PCs, Currid said.

IS folks "need to be ready so that when the company CEO takes the red-eye one day and sees an ad for videoconferencing and calls up to say, 'Let's do it,' you're ready," said Al Lill, research director at Gartner Group, Inc. in Stamford, Conn.

Combining audio, video and data applications for two or more PCs can save users considerable consultation time and travel, users said.

Closer Look
Video-conferencing

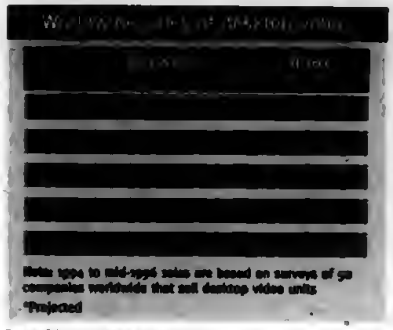
Success stories include the following:

- **Virtual Mortgage Network, Inc.** in Newport Beach, Calif., and **Flagstar Bank** in Bloomfield Hills, Mich., have cut the time needed to obtain a mortgage from weeks to one or two hours.

Homebuyers use a PC — located in a real estate broker's office, for example — to contact a mortgage counselor or underwriter on another PC and talk face-to-face as they decide on the type of mortgage they want. The loan is usually approved at that time.

In both cases, a dedicated group of loan counselors or underwriters works in the home office, answering hundreds of calls per week.

- Officials at **Owens Corning Fiberglas Corp.** in Toledo, Ohio, said it cut in half the time it took to bring to market an insulation product used in Whirlpool Corp. appliances. Technical teams shared drawings at semiweekly desktop videoconferences.
- **Kimmel Cancer Center** at Thomas Jefferson University in Philadelphia has helped doctors at three suburban hospitals discuss the diagnosis and treatment of cancer. They can view and diagram patient images onscreen.
- **The Bureau of Labor Statistics** in Washington has launched a prototype system that allows top officials to talk face-to-face while viewing a live video feed of, for example, President Clinton at a press conference.



Source: Telespan Publishing Corp., Altadena, Calif.

Customer contact

Michael R. Hillman, vice president of business development at Flagstar, said videoconferencing helps re-create the contact customers had 40 years ago, when they could visit a mortgage banker in their neighborhood.

"We're trying to give that face to customers. There's immediate communication and review of an application," he said. "They see the underwriter is a human and a real person."

A demonstration of how a doctor at Kimmel Cancer Center at Thomas Jefferson University in Philadelphia can discuss a fluoroscopic image of a patient's stomach with another doctor in the suburbs

The promise of drastic time savings in getting a mortgage is what brings people in the door to use the technology, Hillman said.

Quality issues

Video quality is usually the biggest drawback for first-time users, but some experienced users said it usually doesn't matter if they see video at only 10 to 15 frame/sec. as long as the sound and their view of data and applications are clear. More expensive units offer 15 to 20 frame/sec. of live video over Integrated Services Digital Network (ISDN) lines, but most don't offer television quality of 30 frame/sec.

Steve Molik, multimedia coordinator at Owens Corning, said his video system is connected by an Asynchronous Transfer Mode network that provides video at 15 frame/sec., creating some jerkiness in the video.

"The first one or two times somebody tries it, it seems to bother [users], but they become very quickly accustomed to it and would rather not go back to the old system. As with any technology, some of the old warhorses are resistant to change."

Still, there are some, even in the computer industry, who are skeptical about predictions of the technology's popularity.

"I don't particularly care to videoconference with the people I work with, but maybe I'd be more willing to do so with my friends," said Chris Day, director of marketing at AuraVision Corp. in Fremont, Calif.

Day's company expects a 500% increase in video chip sales next year, mainly due to the demands of the Asian market. There, many users want their PCs to double as TVs, especially in home settings.

It's all in the details

Organizations that use desktop videoconferencing have some tips for IS workers just starting out with the technology:

- If you plan to depend on ISDN service between LANs or for point-to-point service in a small operation, remember that ISDN connections aren't available everywhere, especially in rural areas. It also might take weeks to get ISDN installed.
- It may seem obvious, but at each desktop, users should consider whether a subject's face or the object viewed for an application has enough light and whether background noise will interfere.
- ATM connections within a LAN improve the quality of desktop videoconferencing and help reduce interference with the data stream over the network. But they are expensive and can be justified only if the desktop videoconferencing application has an obvious and significant payback.
- You should analyze what types of problems your organization wants to solve with desktop videoconferencing and not just adopt the technology because it is new and exciting, said Michael R. Hillman, vice president of business development at Flagstar.

— Matt Hamblen

Charles Schwab is creating a state-of-the-art stock quote system, 88

Corporate Strategies

Desktop video surge forecast

By Matt Hamblen

Sure, most desktop videoconferencing still has limitations — including jerky live video and a complicated setup.

Yet experts and users predict that business use of desktop videoconferencing will explode in the next two to four years, and they are warning information systems managers to be prepared.

The number of desktop videoconferencing units sold to businesses in 1994 totaled 30,000, but that will soar to 6 million in 2000, according to analyst Elliot Gold at Telespan Publications in Altadena, Calif.

Gold said that there will be an additional 14 million home videoconferencing units sold in 2000, a rapid growth partially fueled by the increasingly rich video and audio features on home PCs.

Gold's prediction of 20 million total units sold in 2000 could be low, said analyst Cheryl Currid, president of Currid & Co. in Houstoo "This stuff is going to explode, and it's going to explode in the face of IS," she said

Also contributing to the technology's growth are plummeting costs, improving quality and ease of use, and plans for nearly every PC sold for home or business use to soon have videoconferencing tools bundled in, according to analysts and vendors.

Compaq Computer Corp., for example, has begun bundling video and audio communications capabilities from Intel Corp. on the motherboard of its computers, and it won't be much longer before small desktop cameras are a standard part of most PCs, Currid said.

IS folks "need to be ready so that when the company CEO takes the red-eye one day and sees an ad for videoconferencing and calls up to say, 'Let's do it,' you're ready," said Al Lill, research director nt Gartoer Group, Inc. in Stamford, Conn.

Combining audio, video and data applications for two or more PCs can save users considerable consultation time and travel, users said.

Closer Look
Video-conferencing

Success stories include the following:

- **Virtual Mortgage Network, Inc.** in Newport Beach, Calif., and **Flagstar Bank** in Bloomfield Hills, Mich., have cut the time needed to obtain a mortgage from weeks to one or two hours.

Homebuyers use a PC — located in n real estate broker's office, for example — to cootact n mortgage counselor or underwriter on another PC and talk face-to-face as they decide on the type of mortgage they want. The loan is usually approved at that time.

In both cases, a dedicated group of loan counselors or underwriters works in the home office, answering hundreds of calls per week.

- Officials at **Owens Corning Fiberglas Corp.** in Toledo, Obio, said it cut in half the time it took to bring to market an insulation product used in Whirlpool Corp. appliances. Technical teams shared drawings at semiweekly desktop videoconferences.
- **Kimmel Cancer Center** at Thomas Jefferson University in Philadelphia has helped doctors at three suburban hospitals discuss the diagnosis and treatment of cancer. They can view and diagram patient images onscreen.
- The **Bureau of Labor Statistics** in Washington has launched a prototype system that allows top officials to talk face-to-face while viewing n live video feed of, for example, President Clinton at a press conference.

Worldwide sales of desktop video

	Business	Home
1994	30,000	0
1995	71,000	20,000
1996*	200,000	100,000
1997*	750,000	1.75 million
1998*	1.75 million	3 million

Note: 1994 to mid-1996 sales are based on surveys of 50 companies worldwide that sell desktop video units
*Projected

Source: Telespan Publishing Corp., Altadena, Calif

Customer contact

Michael R. Hillman, vice president of business development at Flagstar, said videoconferencing helps re-create the contact customers had 40 years ago, when they could visit a mortgage banker in their neighborhood.

"We're trying to give that face to customers. There's immediate communication and review of an application," he said. "They see the underwriter is n human and a real person."

A demonstration *of how a doctor at Kimmel Cancer Center at Thomas Jefferson University in Philadelphia can discuss a fluoroscopic image of a patient's stomach with another doctor in the suburbs*

The promise of drastic time savings in getting a mortgage is what brings people in the door to use the technology, Hillman said.

Quality issues

Video quality is usually the biggest drawback for first-time users, but some experienced users said it usually doesn't matter if they see video at only 10 to 15 frame/sec. as long as the sound and their view of data and applications are clear. More expensive units offer 15 to 20 frame/sec. of live video over Integrated Services Digital Network (ISDN) lines, but most don't offer television quality of 30 frame/sec.

Steve Molik, multimedia coordinator at Owens Corning, said his video system is connected by an Asynchronous Transfer Mode network that provides video at 15 frame/sec., creating some jerkiness in the video.

"The first-one or two times somebody tries it, it seems to bother [users], but they become very quickly accustomed to it and would rather not go back to the old system. As with any technology, some of the old warhorses are resistant to change."

Still, there are some, even in the computer industry, who are skeptical about predictions of the technology's popularity.

"I don't particularly care to videoconference with the people I work with, but maybe I'd be more willing to do so with my friends," said Chris Day, director of marketing nt AuraVision Corp. in Fremont, Calif.

Day's company expects n 500% increase in video chip sales next year, mainly due to the demands of the Asian market. There, many users want their PCs to double as TVs, especially in home settings.

It's all in the details

Organizations that use desktop videoconferencing have some tips for IS workers just starting out with the technology:

- If you plan to depend on ISDN service between LANs or for point-to-point service in a small operation, remember that ISDN connections aren't available everywhere, especially io rural areas. It also might take weeks to get ISDN installed.
- It may seem obvious, but at each desktop, users should consider whether a subject's face or the object viewed for an application has enough light and whether background noise will interfere.
- ATM connections within n LAN improve the quality of desktop videoconferencing and help reduce interference with the data stream over the network. But they are expensive and can be justified only if the desktop videoconferencing application has an obvious and significant payback.
- n You should analyze what types of problems your organization wants to solve with desktop videoconferencing and not just adopt the technology because it is new and exciting, said Michael R. Hillman, vice president nf business development at Flagstar.

— Matt Hamblen

Bosphorus Bridge, Istanbul

SPANS TWO CONTINENTS.

Taking the trip from meinframes to open systems? Good timing. Because now there's something thet'll take you ecross the void

It's called the CleerPeth™ femily of servers. The only family with the versatility, muscle end technology that can make your move fester, easier and more effordeble.

From the largest enterprise systems to the smellest open servers, there's a CleerPath product to carry your burden. Like the enterprise-cless 2200 Series. The exceedingly scalable SMP Series. And the object code-compatible A Series.

ClearPath servers

Not to mention the series thet's bringing the you-can't-get-there-from-here naysayers to their knees: ClearPeth HMP, the world's first servers that let you run your existing meinfreme

SPANS TWO UNIVERSES.

stuff, your new open systems stuff or even both from the very same box.

All of which proves that you can finally get to the new world of computing without leaving your investment behind.

http://www.unisys.com or 1-800-874-8647, ext. 230

See the ClearPath Servers at the UNITE Fall Conference in Philadelphia November 4-7/For details call (810) 771-4483 or http://www.unite.org

UNISYS

The Information Management Company

Schwab dials up stock quote system

By Julia King

After two years of development, Charles Schwab & Co. is saving hundreds of thousands of dollars and has virtually eliminated service delays with a new, state-of-the-art stock quote system that centers on the good old telephone.

That's right. The telephone, that relatively inexpensive, reliable and easy-to-use system interface that already sits on every office desktop and in nearly every home in America.

Pair it on the back end with new speech-recognition software from Nuance Communications, Inc. in Menlo Park, Calif., and — voila! — you have the key techno-ingredients of Schwab's VoiceBroker system.

Operational in 15 states, VoiceBroker lets callers speak in conversational English to get quotes on 13,000 stocks and mutual funds — all in real time and all without speaking to another human or negotiating their way through a long menu of keypad options.

Schwab customers simply dial a toll-free number, recite their eight-digit account number and the name of the stock — for example, IBM, International Business Machines or even Big Blue — and instantly receive an up-to-the-minute stock price.

"It seems so simple, but it really is rocket science," said Bob Morgen, project manager and a principal at SRI Consulting, Inc., which helped implement the system.

Schwab's trading desk staffers *have more time to execute stock trades now that VoiceBroker offers customers quotes over the phone*

"What the Nuance speech system is actually doing is taking each sound apart and analyzing it to figure out exactly what the caller said," Morgen explained.

The biggest application development challenge was programming the system to recognize the hundreds of thousands of ways that callers may request stock information.

A customer who wants a quote for AT&T Corp., for example, might say "AT&T," "American Telephone and Telegraph" or "Ma Bell."

"We sat around a table for months sifting through all of the things a person might say," Morgen said.

The project team came up with 2 million permutations on how to identify 13,000 stocks and other financial funds. Today, the VoiceBroker software recognizes them all in real time, he said.

The process

Here's how it works. The request comes in through a voice-response unit and is processed by the Nuance software.

The software analyzes the caller's speech bits and queries a central mainframe for the appropriate stock quote. From there, the quote is routed through the Nuance system to the caller — all within seconds.

The Nuance software runs on a Sun Microsystems, Inc. SPARC server.

When a *Computerworld* editor tested the system last week, several requests for quotes were processed within seconds.

"No matter how busy the market gets, we expect to answer every customer's call immediately. We're hoping to take tens of thousands of calls a day through this system," said Alan Nathan, vice president of voice technology at the San Francisco-based brokerage.

"The benefit to Schwab is that we can better plan for market spikes. It's easier to build in [additional system] capacity than have folks sitting around and not knowing how often their phones will ring," Nathan said.

Prior to VoiceBroker, traders and customer service representatives provided callers with quotes.

Now those people can focus on higher-level activities, such as executing stock trades, Nathan said.

"We're doing with the telephone what it was meant to do," Morgen said. "Touch-Tone [systems] are useful for inputting numbers. But when you need more complex information, you need to talk."

Year 2000 problem comes bundled with legacy of potential litigation

By Thomas Hoffman
SAN FRANCISCO

Every business with a contract or commitment that stretches past 1999 risks an expensive lawsuit if its computers can't keep track of the year 2000. And the bigger the firm, the greater the risk.

The average Fortune 500 company that doesn't make the requisite year 2000 programming changes can expect to pay $100 million in litigation costs, said Capers Jones, chairman of Software Productivity Research, Inc., a software management consulting firm in Burlington, Mass.

Despite such startling statistics, most year 2000 project managers aren't communicating the urgency of the programming problem to auditors and lawyers, according to the results of a year 2000 survey that was issued at the Society for Information Management (SIM) conference held here this month [CW, Sept. 30].

Milliken's Ken Elliott: *Companies need to audit IS staffs to determine where to outsource*

Beyond the legal ramifications, there is the programming. Companies must audit their information systems staffs "to determine where [they are] going to need outside help" for reprogramming date-sensitive code, said Ken Elliott, year 2000 project manager at Milliken & Co., a textile manufacturer in Spartanburg, S.C.

Rooted in the past

Many of the problems organizations face stem from their unwillingness 15 to 20 years ago to pay for additional storage needed to provide programs with four-digit date fields, Elliott said. "It's tough getting management to understand this" now that storage costs have plummeted over the past five years, he said.

Officials at Avon Products, Inc. in New York hope to avoid potential legal obstacles by adding functionality to the company's core financial systems.

With an estimated cost of $18 million to repair all its year 2000-sensitive code, officials at the cosmetics maker have decided to spend an additional $7 million to replace or upgrade all affected programs, said Spencer McIlhmurray, vice president of information technology at the company.

By upgrading its software, Avon can spread the $25 million cost over five years, McIlmurray said. Otherwise, the year 2000 work would have to be classified as a one-time quarterly expense under new accounting rules enacted by the Financial Accounting Standards Board.

Not all companies will be as fortunate.

Leon Kappelman, associate professor of business computer information systems at the University of North Texas in Denton, who compiled the SIM year 2000 study, described a recent conversation he had with the chief information officer at a Fortune 10 company.

The University of North Texas' Leon Kappelman: *Hardware with date-sensitive code may leave a company vulnerable*

The CIO said he expects his company to lick the date problem by replacing all its legacy software with SAP AG R/3 integrated business software. But that strategy doesn't deal with date-sensitive code built in to the company's hardware, Kappelman said.

That could leave the company vulnerable. Corporate boards of directors "need to know about this so they can prepare for the litigation that's going to come," Kappelman said.

Briefs

Investment investigated

The Philadelphia Stock Exchange is investigating its chairman for investing in a small computer firm that eventually won a contract with the exchange to develop a special trading system for institutional investors. The exchange has hired a lawyer to investigate the relationship between Vincent J. Cascella, its chairman since March, and Ashton Technology Group in Columbia, Md., which the exchange hired in September 1995. Although Cascella invested in Ashton Technology before he became the exchange's chairman, he was at that time — April 1995 — heading an exchange committee that recommended the deal.

Year 2000 tool

Computer Horizons Corp., a year 2000 services firm in Mountain Lakes, N.J., has introduced Signature Time Engineer, a software tool for reducing the length of implementation projects by 30% compared with standard data or process-based systems. The reduction is achieved by using software rules and options that allow dates to be "windowed" and aged dynamically. The software, available now for Cobol, is being priced on a client-by-client basis.

TO ANYONE ELSE THIS IS
A FINISH LINE. TO US
IT'S A STARTING BLOCK.

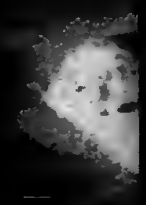
Louis

"Let's plan

For an individual,
a career is a journey.

For a team, careers are a series
of simultaneous journeys.

your
itinerary”



Have you seen your agent today?

Managing

Robert Herbold. The No. 3 man at Microsoft. Former CIO at Procter & Gamble. Computer scientist turned marketing maven. The Zeus of the consumer advertising pantheon. Operations hound. The ultimate business-minded techster. Yes, there are lots of reasons to . . .

Get to know

By Jeremy Schlosberg

When Bob Herbold, chief information officer at Procter & Gamble Co., was named third in command at Microsoft Corp. two years ago, people who knew him said, "Perfect!" People who didn't, which was almost everybody in the information systems world, said, "Huh?"

"Bob Herbold?" a Microsoft analyst at Dataquest asked when called to comment. "Who the hell is he?"

Robert J. Herbold is a former computer lab manager who left IS and became a corporate superstar. More specifically, he ia the executive vice president and chief operating officer at Microsoft, right behind Chairman Bill and Steve Ballmer, executive vice president of sales, marketing and services. And before joining Microsoft, Herbold was in the unusual position of heading both IS and advertising at the No. 1 manufacturer of household products on the planet, Procter & Gamble, in Cincinnati.

And although he's staying behind the scenes at Microsoft, he's making waves. Finance, operations, manufacturing, IS and marketing all fall under Herbold's purview. He meets regularly with IS executives. So far, he's sold a factory, moved Microsoft to standardize its internal data and introduced three-year business planning and new ways to analyze advertising and consumer response. Herbold is injecting rigor and discipline, consumer marketing know-how and IS experience into your most influential vendor.

"Remember, Microsoft is still only a $7 billion or $8 billion company," says Amy Wohl, president of Wohl Associates in Bala Cynwyd, Pa., a workplace technology consulting firm.

"If they want to make it to that next level, then they need experienced financial and general management to help them get there. Bob Herbold is that kind of person. He definitely counts as one of the grown-ups at Microsoft," Wohl says.

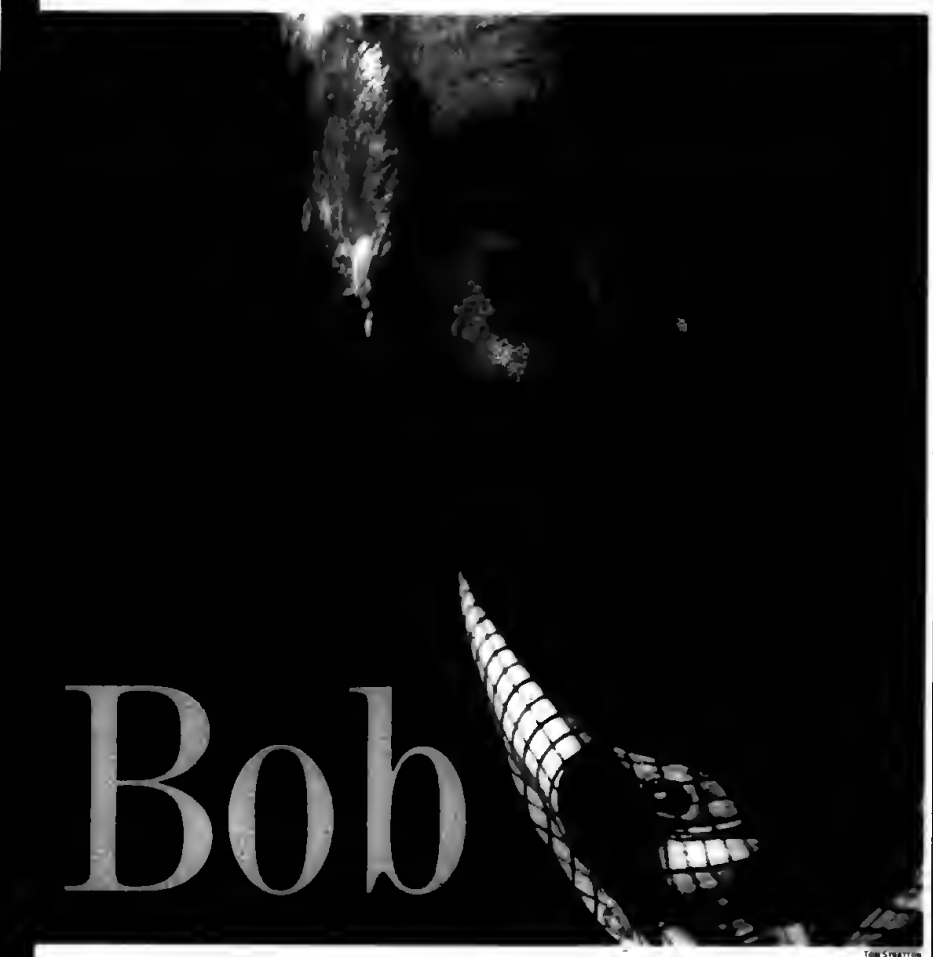
And he got there, in large part, by taking a skill most IS staffers possess — a knack for analysis, rigor and quantification — into a new career in marketing.

Herbold began his Procter & Gamble career in 1968 as a computer specialist and statistician in the Industrial Engineering Division, then moved into IS management.

"He was not only very, very bright, but his aspirations were significantly different [from] most other IS people," remembers Gerard Liberty, a former P&G IS staffer who is now director of information services at Welch Foods, Inc. in Concord, Mass. Herbold, then a thirtysomething, grey-haired IS manager, took a one-year rotation as a brand assistant, marketing's bottom rung, and stayed on.

Why the switch? Herbold was smart enough to realize that "marketing presented the greatest opportunity for reaching a high level at P&G," Liberty says. But Herbold, a trained mathematician, also liked mar-

ADVICE ON ADVICE
GETTING THE "BEST" ADVICE FROM CONSULTANTS IS ALWAYS APPEALING, BUT BEWARE. IT CAN SPELL RUIN FOR IS MANAGERS, PAUL STRASSMANN WRITES. PAGE 97



Bob

TOM STRATTON

keting's number-crunching side. He was fascinated to discover that P&G's marketing folks were quantitatively studying human behavior — that, in his words, "the more you can quantify marketing, the better off you are." The number-crunching quant turned computer scientist found that those skills could mesh with P&G's marketing-driven mainstream culture.

And it helped him fit with his new boss, that Gates fellow. Once Herbold was brought in for official interviews, the chemistry became apparent to everyone. "He and I hit it off well," Herbold says. "He's a very objective guy, a very data-driven guy who is also a great human being, so he's a pleasure to work with."

Through the '70s and '80s, Herbold climbed the P&G marketing ladder, rising to brand manager, ad manager and market research director — one of the great number-crunching jobs in all of business. He moved back to IS in 1987 as manager of information services, was promoted to vice president, then combined his two career paths in 1990 when he became senior vice president of information services and advertising.

He was clearly a player. He controlled the largest advertising budget in the universe and ran an IS organization that supported 99,000 employees and took in $33 billion in revenue. He became deeply involved in operations and logistics, helping to lead his company and the consumer goods industry into the quick response era by using information technology to more efficiently and quickly restock store shelves.

And Herbold had become something of a new media guru at P&G in his final years there. He, in fact, was a prime mover behind the bombshell speech former P&G Chairman and CEO Edwin Artzt gave to the American Association of Advertising Agencies in May 1994. The speech urged agencies to embrace new media.

But generally, Herbold preferred to stay out of the public eye. "P&G execs tend to shy away from the limelight," says a P&G insider who (of course) requested anonymity, and Herbold was no exception. That's not a bad trait for the No. 3 man in a firm with two publicity-loving senior executives.

And although he's a quantitatively oriented computer scientist, he values intuition and gut feelings in the workplace. "He often asks people, 'What does your instinct tell you?'" the P&G insider says. "He knows, somehow, that people may have a difficult time explaining why something is the right thing to do, but they still know it's

Bob, *page 94*

What you can't find could hurt you

WHAT IS IS' JOB IF NOT TO MANAGE INFORMATION?

A summer survey of 700 information systems managers worldwide showed that 80% are "concerned" or "very concerned" about whether they're properly managing the growing mass of information their businesses need.

Among the biggest worries: the performance and response time of applications that deliver information, the security and integrity of the data those applications access and keeping those applications up and running.

The survey, conducted by New York research and consulting firm Find/SVP for storage vendor EMC Corp., found that IS executives are increasingly nervous that their information management failures could hurt the bottom line. Two business areas of prime concern include improving customer service and reducing the time it takes to bring new products and services to market. The study showed 23% more IS managers are concerned or very concerned about those areas compared with last year.

"We have been working for years to come up with what we think is an effective workflow process and strategy," says Roy Wilsker, manager of technology planning at The Kendall Co., a Mansfield, Mass., manufacturer of health care and other products. "That's been complicated by the fact that there are lots of players involved, and there's such a quick turnover of technology. Getting the proper infrastructure to the proper people at the proper time gets more and more difficult."

Before you can manage information, of course, you have to find it. Seventy percent of the IS managers surveyed say there's at least 10 times as much critical data outside the data center as there is inside, where IS at least has a chance of tracking it. "Ninety percent of the information swirling around the corporation is compartmentalized on people's computer disks and private files," Wilsker says. – *Robert L. Scheier*

More F.Y.I., *page 94*

Project managers' suggestion box

SOME GOOD ADVICE FOR KEEPING PROJECTS RUNNING SMOOTHLY

JOT DOWN, FOLLOW UP

It happens all the time. Some IS Cassandra on a project team speaks up about a problem, but the manager forgets to follow up. Result: A preventable problem derails the project. At a recent Project World conference in Washington, Christopher P. Higgins, senior vice president of payment services project management and corporate facilitation services at Bank of America in San Francisco, suggested a way to prevent that. His project managers use a database to track project-killers.

At weekly project team meetings, after the project status is reviewed, members are asked to bring up issues that must be addressed. The project manager enters them in a database, then puts someone in charge of addressing the problem. The issues are brought up at the next meeting and at each succeeding meeting until they're solved.

THE ELIMINATOR

Want a simple way to eliminate redundant, unnecessary projects? Higgins suggests this low-tech technique:
Step 1: Have your project managers write one-sentence descriptions of their projects on index cards.
Step 2: Arrange the cards, placing similar or related projects next to one another.
Step 3: Look. The index cards will show the projects that connect, duplicate or overlap one another.

Higgins says this technique enabled him to eliminate one-third of the projects and consolidate many others. Just one caveat — you'll need a big conference table.

REAL DEADLINES

Tired of missing deadlines? Let your staff help set them.

Jon Hockenberry, a senior IS project manager at Shell Services Co. in Houston, recently led a successful sales force automation project. That team met its deadlines because members were personally and professionally motivated to hit them. "The key was the team committed to the delivery," not him, he says.

Why? Because the team negotiated directly with the sales managers, Hockenberry says. During the negotiations, team members came to understand the business reasons for the due dates the sales managers wanted. They also negotiated to have the project divided into "meaningful chunks," with deadlines for each. Hockenberry says his role was to facilitate the process and underscore the business drivers behind the sales managers' requests, instead of setting the deadlines. – ***Allan E. Alter***

Are you a project manager with field-tested tips to offer? Send them to allan_alter@cw.com. If your submission is used, we'll send you a spiffy alt.cw T-shirt.

Bob

CONTINUED FROM PAGE 93

right. This is very unusual for an MIS guy." His quantitative skills, and those sensitivities, go a long way to explain how he was so successful in his quarter-century career as a "Proctoid."

But now Herbold is at Microsoft. How has he affected the House of Gates? IS managers will probably feel his impact most as an IS insider at the top of Microsoft. There's no denying he's well-equipped to relate to IS management

"He has formed a bridge to people still in IS, in the world he left behind," says Dwight Davis, editorial director at "Windows Watcher," a Windows industry executive newsletter in Redmood, Wash. "He can say, 'Look, I really do understand the issues you face.'"

While Herbold asserts that all of Microsoft's brain trust "get out to the field regularly," he acknowledges that he does "more of it because I *was* one of those [IS] guys, and I still know a lot of those guys. I can explain how we're using technology to run our company so that they can better consider how they might use the same technologies to run their companies." He can also take what he hears from the field back to Redmond; he and Ballmer regularly compare field notes, he says. They like "to make sure we've got the right kind of feedback being put into the system," Herbold says.

He also likes to showcase Microsoft's internal systems. For example, Microsoft's finance intranet is a pet project for Herbold and "one of our hottest demos right now in terms of CIO interest." Herbold says it standardizes financial information globally, gives everyone cost-effective, up-to-date, paperless access to information and is relatively simple to create and maintain.

He also has a big impact on Microsoft's internal operations.

He's introduced certain Fortune 500 business disciplines to Microsoft. For example, he's pushed hard to cut Microsoft's fixed costs. He was a big force behind Microsoft's decision to sell the 500-person Canyon Park manufacturing facility to an old P&G competitor, Tokyn's Kao Corp. (Not that he deserves a reputation as a hatchet man; he says, and Davis confirms, that he wouldn't sell the facility to a company that couldn't guarantee that jobs would remain intact.) Herbold introduced new formal planning processes to Microsoft: three-year technical plans to anticipate where the technology is going, three-year business plans with revenue and profit projections for each business unit and annual head count projections and fiscal plans.

Similar disciplines are sprouting up within Microsoft's in-house information systems. Another Herbold-inspired change has been the move toward standardized data. The biggest step has been redoing the general ledger worldwide as part of the company's SAP installation.

Sexy stuff for most Microsoft staffers? Probably not. But changes such as these help ensure Microsoft won't choke on its growth. "He has increased the level of professionalism in all areas which he oversees," Davis says.

Herbold's fingerprints are harder to make out when it comes to Microsoft's marketing, even though marketing reports to him. He holds his cards close to the vest when it comes to the subject of marketing to corporate IS. He joined the company too late to be responsible for the humongous Windows 95 advertising campaign. And Herbold is the first to admit not everything he learned at P&G about consumer marketing applies to the fast-paced software world.

"And here I used to think the detergent market moved fast," he says.

But Herbold is bringing his love of quantitative analysis to Microsoft's marketing and advertising, particularly in consumer marketing. He also has considerable enthusiasm for the World Wide Web as a marketing medium. If you thought Microsoft was already a marketing powerhouse, you ain't seen nothing yet.

He became closely involved with researching the impact of the Windows 95 ad campaign on consumers — a bit of follow-through Microsoft hadn't done with any of its products in any sort of standardized way.

He's also bringing new marketing research tools to the Gates crowd. One new tool Herbold is especially proud of introducing to Microsoft is the so-called split-cable test. This methodology lets an advertiser control which households receive certain TV advertisements. "It's a fantastic and precise tool," Herbold says. "You can really see how your television advertising is working."

And just as he was at P&G, Herbold is equally enthusiastic about Microsoft's charge onto the Web. "We're jumping all over the Internet as a marketing tool," he says. What he likes best about online activity is how "it gives a new level of quantification to marketing." On a Web page, he can automatically track the number of people who have visited a certain page, the number of clicks on the banner to link them to more detailed information about a product and the number of people who sign up to receive additional information.

"It's like instant direct mail," he says. "It's very exciting."

No, most computer scientists don't find direct mail exciting. But Herbold shows the distance between mainframes and marketing can be bridged. Yep, a quant, a numbers guy, a computer scientist who goes in for systems and rigor can make it to the top of corporate America. Who says CIOs can't get ahead? ■

Schlosberg is a freelance writer in Cincinnati.

The Herbold file

ROBERT J. "BOB" HERBOLD

AGE: 54

TITLE: Executive vice president and chief operating officer at Microsoft

RESPONSIBILITIES AT MICROSOFT: Overseeing worldwide operations, including finance, manufacturing, distribution, logistics, IS, human resources, corporate services and real estate. He also oversees Microsoft Press and all corporate marketing activities.

KEY POSTS AT PROCTER & GAMBLE: Herbold's last P&G post was senior vice president of advertising and IS. Before that, he was:
- Manager of Miami Valley (R&D) Labs Computer Center
- Brand manager of Spic & Span
- Advertising manager of Packaged Soap and Detergent Division
- Manager of market research department
- Vice president of information services

EDUCATION: Bachelor's degree, University of Cincinnati; master's degree in mathematics and Ph.D. in computer science, Case Western Reserve University

FAMILY: Married to an attorney; three children, all college graduates

HOBBIES: Hiking, fishing

IBM Software Servers solution No. 1 of a series

Build a Website for your business without hiring your nephew.

Establish your presence on the Web with the help of Lotus Notes.® It lets you set up and maintain a home page and distribute information easily. So your customers and employees can use the Net to communicate anytime, anywhere.

IBM Software Servers solution No. 2 of a series

Get your people to work together even if they're spread across the world.

Now your employees working in virtual environments can collaborate online, so decisions can be made more quickly. Lotus Notes provides a central access point to facilitate the collaborative process. And the faster you get to market, the faster your sales will increase.

IBM Software Servers solution No. 5 of a series

Improve customer service by providing your employees the right tools.

IBM Software Servers can help your staff communicate more effectively with customers. For example, a simple credit card inquiry can be resolved instantly with up-to-the-minute answers, even on the intranet. And timely answers reduce overall operating costs.

It's easier to solve business problems when you've got a number of options.

Taking advantage of the Internet is one of the smartest options you have. To find out why, simply call, write or visit our Website for a free copy of *A Guide to Business on the Internet.*

Call 1 800 IBM-2468, ext. GE135

Visit us on the Web at www.software.ibm.com/info/sn4/

Or fill out this coupon and mail it to:
IBM Corporation, P.O. Box 447, Buffalo, NY 14207-9896

Please indicate how you'd like to receive your complimentary guide.

☐ 16-page booklet ☐ 3.5" diskette ☐ CD-ROM also packed with other valuable information

Name_____

Company Name_____

Telephone_____

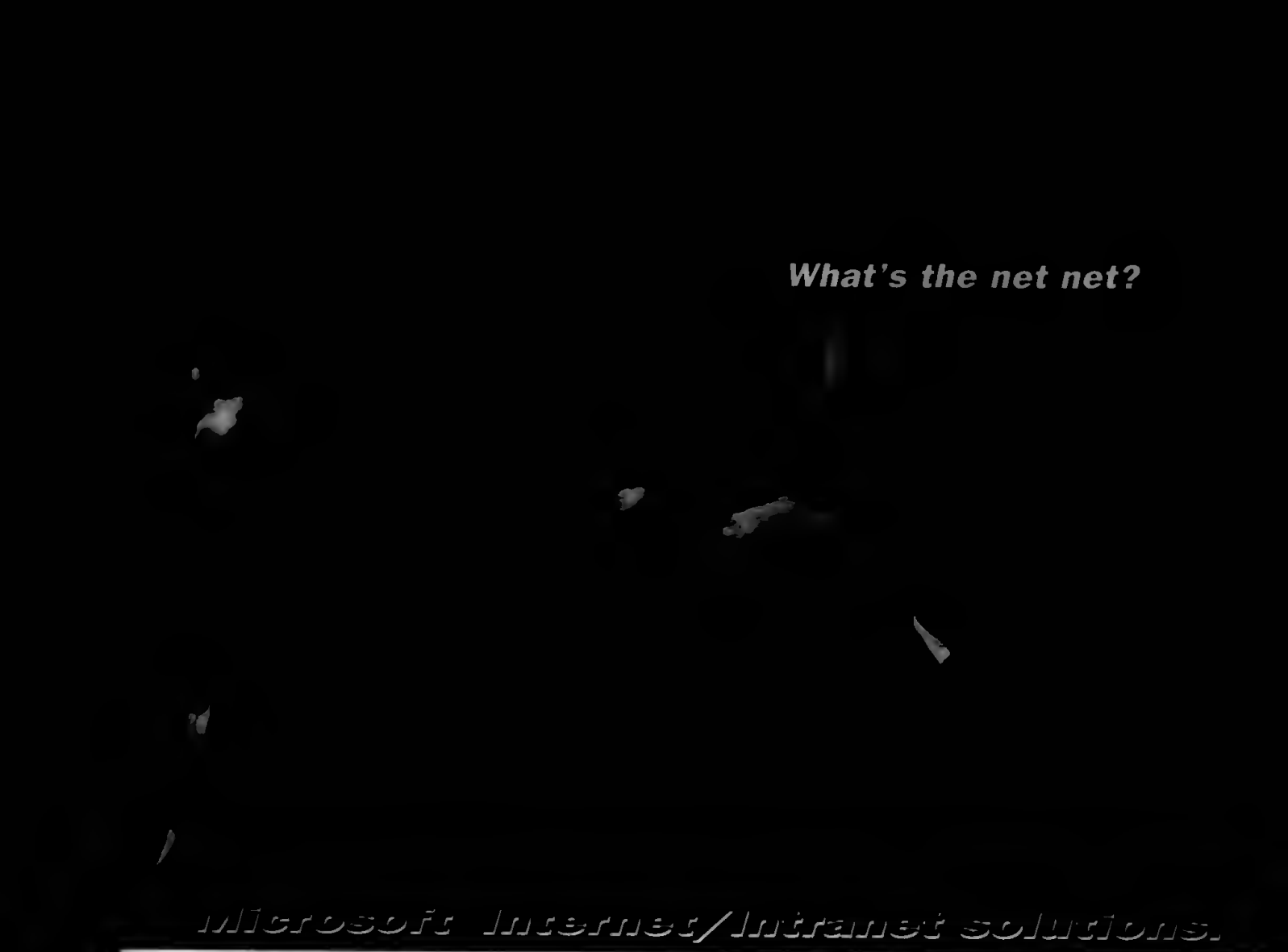
Address_____

City_____ State_____

ZIP_____

Solutions for a small planet™

IBM®



Microsoft Internet/Intranet solutions.

Come to a free, half-day briefing and find out how the right solutions can help your company work smarter—and more profitably.

As you know all too well, talk is cheap, but technology isn't. That's why we're cutting through all the chatter to provide you with a strategic overview of new technologies which can help keep information, work and profits all moving together.

You'll get an inside look at Microsoft technologies for today and tomorrow, including highlights of the latest Internet/Intranet developments and how they're incorporated in many of our products. You'll observe the latest Microsoft-based solutions for taking advantage of Internet business opportunities, maximizing the benefit from communication-enabled line-of-business applications, enhancing team collaboration with a company Intranet, and more. You'll see first-hand how Microsoft Solution Providers are uniquely qualified to provide you with solutions at an unprecedented level of functionality. And you'll have a chance to sign up with a Solution Provider to conduct a customized evaluation of Microsoft Internet and Intranet products, the latest version of Microsoft Office, Windows® 95, BackOffice™, and development tools.

If you're a business decision maker or information technology professional in an organization with 100 or more employees, and you need to use technology to accomplish business objectives, this briefing is for you.

Call (800) 836-8282, Dept. A778 today to get information about a briefing near you.

Publication Sponsor
COMPUTERWORLD
The Newspaper of Information Systems Management

Microsoft
WHERE DO YOU WANT TO GO TODAY?

©1996 Microsoft Corporation. All rights reserved. This document is provided for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS SUMMARY. Microsoft and Windows are registered trademarks and BackOffice and Where do you want to go today? are trademarks of Microsoft Corporation.

[redacted]

Best practices? Or placebos?

Need advice on how to manage IS? Watch out for everyone who claims to know which 'best practices' will fit all companies.

Some of the most prominent U.S. consultants and advisory services now present their clients with comprehensive checklists of what are, in their opinion, the attributes of excellence for managing information systems.

Advisory services offer tips and high-priced periodic reports on whatever topic seems to befuddle information executives. Large consulting firms collect their best practices in an unending stack of loose-leaf binders. Those become handy sources of repeatable advice for their less experienced consultants.

Having a comprehensive compilation of best practices is good business. A recent series of full-page advertisements from one of the largest consulting firms declared that " ... our professionals will start by sharing ... what works best for others."

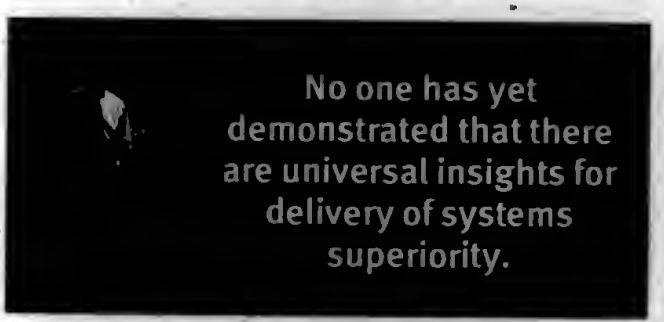
Receiving the "best" advice is always appealing to managers looking for assurance that they are doing the right thing. But beware: It can spell ruin for IS managers.

Any idealized list of what is "best" could be irrelevant in dealing with a company's unique maladies. Managers who adopt generic lists without understanding their companies' real problems, priorities, schedules and budgets are sure to end up searching for new jobs.

Consultants don't explain how they come up with their suggestions except by mentioning that they reflect the experts' views. Nor do the originators of best practices lists explain how they validated their prescriptions with independent performance measures such as profitability.

Consultants like the best practices approach because it lets them write an impressive report based on their firms' preferred practices and methodologies.

But if you are still sanguine about best practices lists, consider this:



There is evidence that excellence can't be based on complying with even the most elaborate set of desirable attributes. Just consider the most prestigious prize in U.S. business — the Malcolm Baldrige National Quality Award, given out annually by the U.S. Department of Commerce.

The Baldrige award

The checklist to qualify for the Baldrige award is by far the most comprehensive catalog of what experts believe to be prescriptions for excellence. Specially appointed examiners rate hundreds of acts before they can certify that an organization has earned a nomination.

How have those "quality" companies fared in the real world? I examined the financial results of all 23 Baldrige winners through last year. My purpose was to discover if economic performance is related to the high ratings for complying with what prominent experts believed to be standards for excellence.

Ten organizations are privately held or have been merged, and therefore financial data isn't available. One of those firms, Wallace Co., filed for bankruptcy protection two years after it won the Baldrige in 1990.

Of the remaining 13, results are published only for the parent company, some of which entered just one of their major divisions in the contest. Nevertheless, in each case the parent company spread the fame to the entire firm. Therefore, I felt justified to look at the total financial results of the Baldrige winners.

Only two of the 13 firms show a positive economic value-added (defined as profits minus costs of shareholder equity) for the seven-year period from 1988 through 1994. Solectron Corp. and Corning, Inc. added $134 million to the U.S. economy. Eleven of the winning firms, including Armstrong World Industries, Inc., Eastman Chemical Co., Xerox Corp., Federal Express Corp., Texas Instruments, Inc., Westinghouse Electric Corp., General Motors Corp. and IBM, show negative economic value-added. They detracted $101 billion from the U.S. economy.

Implications for CIOs

Consultants, as well as government agencies, have developed exhaustive checklists of generic best solutions for IS. They are comparable to a pharmacist's reference book that lists all the wonderful vitamins, miracle drugs, ointments and injections.

But consuming the best pharmaceuticals indiscriminately won't guarantee superior health. Medicines are effective only after correct diagnosis, correct prescription, adherence to instructions and continued good care.

Instead of seeking to adopt the best practices from somebody's list, chief information officers would be better off by first coming up with ways to determine what their firms really need. CIOs need to devise processes that will assure that they comprehend and can measure what performance goals are worthwhile. Only after that is done is it safe to look up a catalog of good ideas and find which ones may fit their situation.

IS executives should beware of anyone who invokes generally applicable best practices as the source of his or her authority. No one has yet demonstrated that there are universal insights for delivery of systems superiority. Not enough is yet known about the influences that deliver exceptional organizational performance. Anyone who presumes he or she can compile a generic list of what makes excellent information management is guilty of peddling placebos instead of curing ills. ■

Strassmann can be reached at paul@strassmann.com or on the World Wide Web at www.strassmann.com/.

CENTURA
PRODUCTS MAKE CARS MOVE FASTER FOR MERCEDES-BENZ® CREDIT CORPORATION.
Using Centura Software Corporation's powerful client/server software, Mercedes-Benz® Credit Corporation created an asset management application that helps cars coming off existing leases move out to customers three times faster.
"We looked at a number of development environments, but only Centura offered us an easy-to-use solution with enough power and flexibility to develop all the functions we wanted within the application."
— Peter Aitken, Manager, Application Development, MBCC
Featuring powerful tools for rapid application development, team programming, connectivity, and remote deployment, Centura's products enabled Mercedes-Benz Credit Corporation to create a
application that integrates corporate
frame data and runs
200 dealerships across
the important thing to the
the application gives them
to the information they need to
competitive — and sell cars faster
ever before.
Take A Free Test Drive.
So call today for your free test drive of our new Centura product line. After taking our new model for a spin, we're sure you'll realize what over 1.5 million users have already learned: Centura products are engineered like no other software in the world.
CENTURA
SOFTWARE CORPORATION
formerly known as GUPTA
1-800-444-8782 x407
http://www.centurasoft.com
CENTURA
1060 Marsh Road • Menlo Park CA 94025 • (415) 321-9500 • FAX

FIRING LINE

Buyer's Guide

Users approve of Oracle's Web strategy

BY AMY MALLOY

Second in an occasional series of reviews that focus on the World Wide Web-enabling strategies of the leading database vendors.

Connecting back-end databases to a front end for intranet use is new technology, but Oracle Corp.'s line of intranet-based products is getting positive reviews from early users.

Oracle is one of several companies — typically known for database applications — that have joined the list of Internet/intranet vendors. On July 16 Oracle held an intranet strategy day, outlining products that the vendor claims provide an "end-to-end solution for business-critical corporate intranets."

Computerworld spoke with several Oracle users who are in the early implementation stages with Oracle's products and who have been eyeing Oracle's strategy. At this point, user companies are experimenting with product capabilities. None of the users *Computerworld* spoke with uses all the features of the product line.

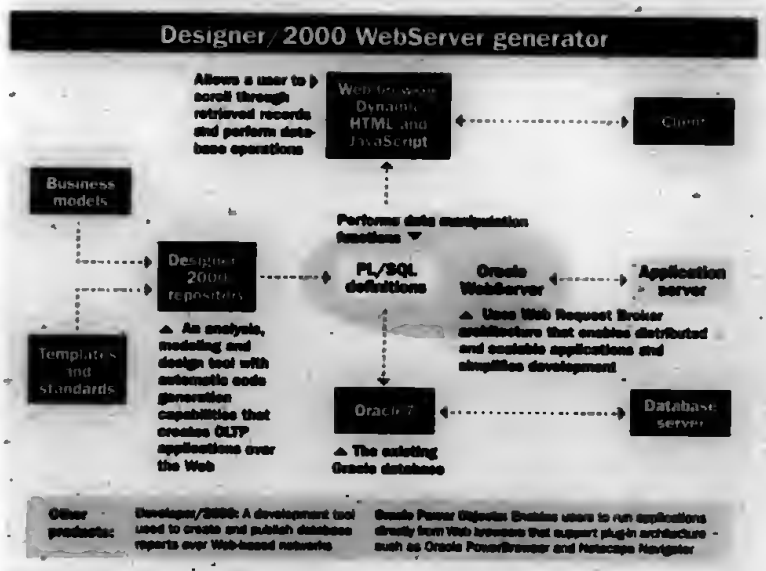
Computerworld interviewed John Fontaine, webmaster at Trade Compass in Washington; Fred Loebl, manager of database administration at Chiron Corp. in Emeryville, Calif.; Luc Verhelst, information technology manager at Kind and Gezin in Brussels; and Dan Mallin, electronic marketplace manager at Imation Corp. in Oakdale, Minn.

Those early users say they think Oracle's got what it takes to succeed in this realm. "I think they've got a very good plan," Fontaine says. His reasoning: Oracle is helping companies translate information from legacy systems into current models, unlike the move from the mainframe to PCs where companies had to reinvent. Information housed in databases is still usable.

Users credit Oracle with taking an active approach to the Internet. "They are not waiting to see how the Internet develops. They are out there shaping it themselves," Loebl says.

Using Oracle's online analytical processing product, Fontaine is able to "do sophisticated analysis of data." For instance, his company provides trade information and, using those products, it's able to produce amounts and graphs that provide information such as trade patterns between the U.S. and Japan.

When it comes to intranets and corporate databases, each company's needs and purposes are different. Additionally, companies pick and choose among Oracle's intranet line. Using a combination of Oracle's products, Kind and Gezin, a Belgian government organization, plans "to generate dynamic HTML pages by accessing Oracle databases," Verhelst says.


Designer/2000 WebServer generator
Allows a user to scroll through retrieved records and perform database operations
Web browser Dynamic HTML and JavaScript
Client
Business models
Performs data manipulation functions
Designer/2000 repository
PL/SQL definitions
Oracle WebServer
Application server
An analysis, modeling and design tool with automatic code generation capabilities that creates OLTP applications over the Web
Uses Web Request Broker architecture that enables distributed and scalable applications and simplifies development
Templates and standards
Oracle 7
Database server
The existing Oracle database
Other products:
Developer/2000: A development tool used to create and publish database reports over Web-based networks
Oracle Power Objects: Enables users to run applications directly from Web browsers that support plug-in architecture — such as Oracle PowerBrowser and Netscape Navigator

Whichever approach companies take, the basic issues of installation, development, maintenance and support affect all users. The users who were interviewed discussed their experiences in those areas and graded Oracle products in general. Grades given by each company are listed in the following order: Chiron Corp., Trade Compass and Imation Corp. Kind and Gezin didn't provide grades.

INSTALLATION

A B D

When it comes to ease of installation of these products, it seems fair to say it depends on the installer and the company's platform. Mallin uses Designer/2000 and Developer/2000, and he has installed WebServer 2.0. But he notes, "To get all three of those up and running on a system is a major pain." He attributes that to the fact that "they are typical big systems, rather than shrink-wrap software."

Others beg to differ. "[Installation] is an area where Oracle has improved. All the bugs are worked out," Loebl says. He uses Designer/2000 and Developer/2000 and will install WebServer before the end of the year.

And another user said it was a relatively smooth process. "We had no particular problems installing the tools," says Verhelst, another user of Designer/2000 and Developer/2000 and soon to be a user of WebServer.

DEVELOPMENT ENVIRONMENT

A B+ C

After installing WebServer, Designer/2000 and Developer/2000, users found the development environment accessible. Fontaine says the Web administration facilities, tools and class libraries met

Oracle's new strategy, *page 100*

New strategy

CONTINUED FROM PAGE 99

his needs and were easy to use.

But one user wanted a simpler environment. "I would like to be able to hire someone with s base-level knowledge and have them run it without extensive training," Mallin says.

According to users, maintaining the code in this environment is easy. "Very easy to use," Fontaine says.

Loebl agrees. "It is very easy to maintain the code," he says. According to Oracle, automatic code generation and wizards reduce coding considerably, and debuggers flag and help narrow down and locate coding inconsistencies.

SUPPORT

A B B

"It has gotten very good recently," Loebl says about Oracle's technical support. He attributes that to Oracle's understanding of the customer's changing needs. "It is one of Oracle's pluses." But he's quick to point out that that hasn't always been the case with Oracle.

"I have not had to rely on technical support. I've had no problems," Fontaine says.

Similarly, Mallin says he has been generally pleased with support but adds that it could always be better. And he would like Oracle to provide more services and handle more of the overall process for Imation.

ACCESSING NON-ORACLE DATA

This isn't an area that greatly concerned users, but the one user who needed access to non-Oracle data regretted that he did. "It is very difficult. You are locked into using Oracle as s back end," Loebl says. As s result, his company no longer tries to access non-Oracle data; Chiron found it too difficult.

Another user avoided the problem by moving a proprietary database to Oracle. Now, accessing the information isn't s problem.

Similarly, Mallin didn't attempt to access non-Oracle data. "We have s few legacy databases, but we are migrating away from them," he says. ■

Malloy is *Computerworld*'s assistant researcher.

IntraBuilder brings databases to Web

BY GARRETT N. RAY

Try deploying s company database sucb as a telephone directory over your intranet, and most likely you'll require an army of developers with expertise in Hypertext Markup Language (HTML), Common Gateway Interface (CGI) and database and networking skills. Or you might consider s faster, easier and cheaper alternative: Borland International, Inc.'s new IntraBuilder development and delivery system for internal company intranets.

IntraBuilder was announced in July and began shipping recently. Given the limitations of this beta-test version, I was unable to test the performance and throughput of IntraBuilder in s live departmental setting. Clearly, those areas remain an open question. But in the areas of development and deployment, it appears that IntraBuilder will provide an enormously speedy and useful solution to any company that wants to build database-active intranets.

Released for beta-testing in August, Borland's intranet development system includes s series of visual development tools to create forms, reports and databases. It also includes the middleware technology needed to deliver persistent database connections over an internal TCP/IP network. Using IntraBuilder, a developer can create, test and deploy an intranet-ready database application in hours or days rather than weeks or longer.

In the fashion of almost all of Borland's database and programming products, such as Delphi and Visual dBase, IntraBuilder is first and foremost a visual development tool. That means faster and more coherent development efforts.

Creating an application

Creating an IntraBuilder application is very straightforward. Using s new or existing database, developers begin with the field-level data to build new reports, forms and queries. The process is almost identical to that of Borland's Visual dBase and Delphi. I had no difficulty creating new database tables almost instantaneously or enabling existing Paradox and dBase database files for intranet deployment.

The next step is to develop forms and reports. Rather than requiring extensive use of HTML; IntraBuilder provides "Experts," which are automated, step-by-step wizards that guide developers through the construction of forms and reports. (Other Experts are provided for table and home page creation.) A related set of Visual Property Builders allows fine-tuning of most report or form components, such as fonts and colors. Using those tools, developers can readily customize the look and feel of an applicatioo.

A special "custom form set," whicb can be crested by the intranet developer, allows one form to inherit the properties of another. Thus, s particular look can be created once and used repeatedly in subsequent forms. Changes made to the parent custom form set will automatically be used by all related child forms, saving extensive development time. The familiar Borland properties palettes allow detailed customization of almost every object in an spplication. For example, the font, alignmeot and rotation of text fields can be minutely adjusted.

A script editor provides hand-coded access to all IntraBuilder components. Because all components ultimately are stored as JavaScript, developers can extend and modify IntraBuilder spplications by hand, d desired. But IntraBuilder's JavaScript orientation doesn't levy penalties on the user of an applicatioo because all JavaScript runs on the server side. Users can freely use the browser of their choice.

In addition to the development environment, IntraBuilder includes three underlying middleware components that eliminate CGI coding headaches.

The Borland Database Engine (BDE) — which is also provided with other Borland tools such as Delphi — provides native, back-end support for dBase DBF and Paradox DB files. The BDE is also compatible with Microsoft Corp.'s Access and a variety of SQL-compliant database engines via Open Database Connectivity and Borland's SQL Links database drivers. Because of the inherent integration of the BDE within IntraBuilder, developers won't have to work with CGI at all to obtain database connectivity.

Borland's IntraBuilder *can use new or existing databases to create applications*

Two other IntraBuilder components provide similar back-end functions, though developers will rarely, if ever, need to work with those directly. IntraBroker is IntraBuilder's interface to the CGI, Netscape Server API (NSAPI) or Internet Server API (ISAPI) services provided by a variety of Web servers, such as O'Reilly & Associates, Inc.'s CGI-compliant WebSite 1.1 server, which was used in this review. And the IntraBuilder IntraServer automatically converts database queries and activities to and from JavaScript for execution on the server.

The basic IntraBuilder package ($99.95) supports s CGI-compliant server and Borland DBF and DB databases. It is packaged with Borland's Personal Web Server. The $499.95 IntraBuilder Professional will provide support for concurrent Web connections and for ISAPI- and NSAPI-compliant servers; and support for database drivers for Microsoft's SQL Server and Borland's InterBase. It includes the Netscape Fast Track Server. Both versions require Windows 95 or NT.

At press time, IntraBuilder was available for evaluation from the company's Web site (www.borland.com). Final delivery dates hadn't been announced. ■

Ray is a freelance reviewer in North Conway, N.H.

"because they rock," and other

technical reasons why Netscape

uses Silicon Graphics WebFORCE servers,

according to Webmaster Robert Andrews.

When you're the busiest site on the Web, when you receive more than 112 million bits a day, when you download 2.8 terabytes in a single week, you need servers that you can depend on. That's why Robert Andrews, Netscape's Webmaster, turned to Silicon Graphics. Our WebFORCE™ servers combine 64-bit MIPS® RISC microprocessors with the highest data throughput in the market. Our revolutionary S2MP™ system architecture, with industry-leading I/O, performance and scalability lets your Web site handle even the most demanding workloads. And since Silicon Graphics offers the widest range of compatible servers, you can scale your Web site smoothly as your on-line business grows. Technically speaking, it's the best server you can buy. And it can keep your Web site rockin'. For more information visit our Web site at www.sgi.com/Products/WebFORCE or call 800.636.8184 Dept. LS0054.

NETSCAPE

See what's possible

Silicon Graphics Computer Systems

© 1996 Silicon Graphics, Inc. All rights reserved. Silicon Graphics and the Silicon Graphics logo are registered trademarks, O2, Origin, Origin200, Origin2000, S2MP, WebFORCE, and See what's possible are trademarks of Silicon Graphics, Inc. MIPS and the MIPS RISC Certified Power logo are registered trademarks of MIPS Technologies, Inc. Netscape and the Netscape logo are trademarks of Netscape Communications Corporation.

COMPUTERWORLD

The Newsweekly for Information Technology Leaders

Dear Computerworld Reader:

Thanks – You're one in a million!

(actually, you're one in 909,300, but we rounded up)

Johanna Ambrosio, Gary Anthes, Charlie Babcock, Mary Brandel, Jane Bruzzese, Rosemary Cafasso, Patrick Dryden, Jamie Eckle, Ellen Fanning, Chris Flanagan, Kevin Fogarty, Sharon Gaudin,

The latest readership scores are in and, thanks to you, Computerworld has proven again to reach one of the largest audiences of any weekly IS publication in the country. That's right, according to the Intelliquest Computer Industry Media Study v.3.0, **909,300 business influencers read Computerworld every week.**

In publishing, that's a pretty impressive number.

But we know it's not the numbers that impress you. And while we are pretty proud, we want you to know that we are more committed than ever to bringing you the news and information you need.

So thanks from all of us who write the words and design the pages that keep you coming back every week. You make us feel like a million...

...or at least 909,300.

Bob Wallace

Kimberly Gilliard, Frank Hayes, Justin Hilliard, April Jacobs, Julie King, Kim Nash, Lisa Picarille, Monica Sambataro, David Waugh, Neal Weinberg, Mary Beth Welch, Randy Weston, Lorraine Witzell

Superior automated back-up and restore from the world's largest manufacturer of 8mm tape libraries.

Some things are hard to believe. Like disasters and total data loss. But these things happen; there's documented proof. If it ever happens to you, an Exabyte 8mm tape library will restore your data faster than you can say "mission critical."

Exabyte libraries employ sophisticated technology, like intelligent robotics and multiple drives working in parallel, to ensure fully automated back-up and rapid file retrieval. Our modular, field-replaceable-unit design yields maximum uptime. And when equipped with our new Mammoth drive, a single library can store from 140 gigabytes up to 3.2 terabytes of data at a transfer rate up to 86.4 GB/hr.*

As the leader in 8mm technology, we've designed our libraries to be compatible with 60 software applications across all cliant/sarver platforms. And Exabyte is the only manufacturer to design all the components in a family of libraries; these include drives, media and robotics. Our tape library expertise eases integration, assures a clear upgrade path, and delivers superior performance, all at just pennies per megabyte.

Capacity, performance, reliability, and fully automated back-up: It all adds up to peace of mind that's, well, unbelievable.

Call 1-800-EXABYTE for your free storage automation planner.

EXABYTE®

http://www.exabyte.com

*2:1 compression ©1996 Exabyte Corporation. Exabyte is a registered trademark of Exabyte Corporation, 1685 38th Street, Boulder, Colorado, 80301 USA.

In Depth

REUSE REVEALED!!!

BY ROBERT L. SCHEIER

"LOSE 20 POUNDS *IN TWO WEEKS!* GET IN SHAPE *PAINLESSLY!* *NEVER* WRITE CODE AGAIN!"

CONFLICTING STANDARDS! LACK OF LIBRARIES! TRAINING !

They all *conspire* to prevent *objects* from ruling the *world*!

But don't give up! We've worked out a rational, achievable program. The following four steps toward software reuse won't break your budget – or your reputation.

BUILD THE BUSINESS CASE FOR REUSE

What to do: Educate your staff and business partners about the need for reuse and what it takes to achieve it.

Why: You'll need broad support to make the heavy investment in tools, infrastructure and training needed to achieve reuse.

For example, Chubb & Son, Inc. spent four years and millions of dollars to build a companywide data model to move toward reuse. That project had the backing of a business manager who wanted to bring insurance products to market more quickly while holding down information technology costs, says John Carducci, vice president of information services at the Warren, N.J., insurer.

To enforce the common technology standards and processes needed for reuse, you need "management from the top saying, 'Reuse is important to us,'" says Bryan McElderry, manager of integrated application technologies at Chevron Information Technology Co. in San Ramon, Calif.

How to do it: Establish metrics that show your level of software reuse and your progress as investments

Reuse revealed, *page 106*

REUSE REVEALED!!!

CONTINUED FROM PAGE 105

pay off. Demonstrate the value of reuse in projects that are big enough to matter but not large enough to endanger the company. Use intranets to show users how rudimentary components such as pictures or logos can be shared and reused, then extend the concept to more complicated components.

Costs/risks: You may spend an much money or time making the case for reuse that you never get started on the technical work. Talk of high costs may scare off business managers unless you can make a compelling case.

BUILD THE INFRASTRUCTURE FOR REUSE

What to do: Put in place the necessary hardware, software, processes and skills.

Why: Developers must think of development in a new way before they can build, find and reuse components. Users must have common hardware and software platforms on which to run those components.

How to do it: Create an enterprise data model.

"If your data isn't consistent, you won't be able to reuse the components" that use that data, says Susan Olszewski, an MIS executive at AT&T EasyCommerce Services in Parsipanny, N.J. Train developers in functional design and modeling, which will make them think about reuse early in the design stage. Create a component repository that makes it easier to store, document, track and find components. Set and enforce standards for such things as development tools, operating systems and database servers.

Companies that are serious about reuse must eliminate "islands of technology" that can't share components, says Paul Bassett, a founder and senior vice president of Netron, Inc., a software development tool vendor in Toronto. A three-tier architecture that separates the application logic from user interfaces and databases makes it easier to build business logic that can be reused, even as interfaces or the data change.

Costs/risks: Setting common standards takes time, money and haggling. A massive task such as developing a corporate data model can bog down in "analysis paralysis," Olszewski says.

Carducci agrees. "You need to focus, and you need a deliverable," he says. "You can be out there delivering all things to all people, and you wind up delivering nothing to no one." But beware: Rushing to the wrong tools or developers can cause expensive delays.

BUILD ON WHAT YOU HAVE

Why: The business knowledge and applications you've already developed are an invaluable asset. Reusing whatever you can is far less expensive than building every reusable component from scratch.

What to do: Start with existing business rules, stored procedures or even business-area analyses rather than developing exotic object-class libraries. That allows you to get your feet wet and show some business payback relatively quickly.

Chubb, for example, used Texas Instruments, Inc.'s Information Engineering Facility to create a repository of business rules stored as more than 400 tables in a DB2 database. The business rules are reusable components, which Chubb combines to support new insurance products. The goal is to let Chubb create products by simply entering new business rules, thus requiring little or no additional programming. Because the system just became operational, Carducci says, it's too soon to tell whether that will happen.

That approach holds some promise for Shimmoo Schwartz, even though the manager of MIS for the portfolio management group at money management firm Sanford C. Bernstein & Co. in New York is otherwise thoroughly skeptical about software reuse. "Very often, [we ask users] over and over, 'How does this process work?' " he says. "If this were documented, we could get a certain kind of knowledge reuse" even if that falls short of code reuse.

Although he's skeptical about widespread reuse, "small, generic stored procedures can be pretty easily reused," Schwartz says. He adds that basic database functions such as inserts, deletes, updates and some selects can be reused.

Costs/risks: As in the case of Chubb, even limited reuse can have high up-front costs. Limited reuse may also result in "stovepipe" collections of components that can be reused only within business units.

BUILD MOMENTUM NOW!

What to do: Start small, but start. Don't wait until you find the ideal methodology, development tool, repository or component library.

Why: It's the most cost-effective way to teach your organization — and yourself — about reuse while delivering the business benefits you're paid to produce.

How to do it: Begin by building low-level components that provide generic application services, such as printing, dialog boxes or basic workflow functions.

Another pragmatic approach is to let reuse develop naturally among small groups that work with common tools on common problems. "We use C++ for some projects, Smalltalk for other projects and Visual Basic plus OLE for other projects," says Pat Kerpan, head of technology at CBIC Wood Gundy, a New York investment banking firm. Because members of each group all use the same tool and are under pressure to get an application out the door, he says, they will naturally reuse objects rather than rebuilding them individually.

Costs/risks: As with the previous strategy, the risk is that reuse will never spread across departments, business units or individual development projects. ■

Scheier is *Computerworld*'s senior editor, management.

IS THE WORLD CRAZY? OR IS IT MARY-JANE JARVIS?

While her peers can't seem to get beyond low-level software reuse, Mary-Jane Jarvis' development team at Hudson's Bay Co. has created six applications. They range from 100,000 to more than 4 million lines of code, of which 85% to 90% is reused code. What's more, she says, those applications were written in a Cobol-like language that developers actually were eager to try.

The tool is Netron/Cap, recently renamed Fusion, from Netron. But what is perhaps more important is the underlying concept behind it, called frames. Frames are software components that resemble objects in that they can include descriptions of data, the actions to be taken on that data or both. As frames are combined, they produce objects. In the process of creating object classes, the frames can adapt one another, says Paul Bassett, founder and vice president of research at Netron and author of *Framing Software Reuse: Lessons from the Real World* (Yourdon Press, Upper Saddle River, N.J.).

This "adaptive reuse" is important, he says, because it frees developers from having to create separate classes of objects whenever the application changes.

Does it work? "In terms of raw Cobol code, we're creating only about 10% to 13%" of the code required for applications, says Jarvis, director of development support at the Toronto-based retailer. "The rest is reused."

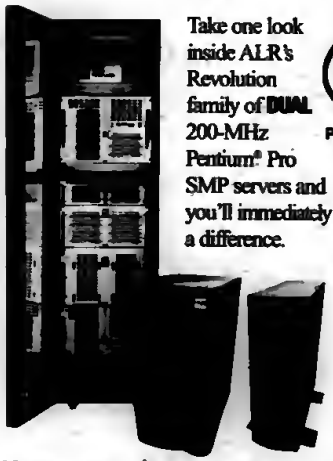
Frame technology may work, but it isn't magic. As with objects, frames require developers "to conceptualize reusable things, as opposed to just thinking in terms of Cobol lines" of code, Jarvis says. "Not everybody does that well." To help her staff over the "mind-set change," her company over the course of three years paid Netron something "in the low seven figures" for consulting help, a figure that doesn't count training costs.

Then there's the danger of becoming dependent on a relatively obscure, $15 million software company whose tools could wither if they don't get enough support from the market. Jarvis says that's a limited risk because Fusion generates Cobol code that would still be reusable without the Netron tool set. Then there are the challenges of finding developers who won't give her a funny look when she asks if they know frames.

But deep down, Jarvis knows she isn't crazy because she's achieving more reuse than most developers who tried more well-known object-oriented languages. "If we had brought in Smalltalk," for example, she says, "I bet we wouldn't be where we are today." — *Robert L. Scheier*

ALR's
Dual Ready
Pentium Pro
SMP Servers
starting at $3,995

But doctor, it's got two!



Take one look inside ALR's Revolution family of **DUAL** 200-MHz Pentium® Pro SMP servers and you'll immediately see a difference.

Networks come in all shapes and sizes, and so do these dual processing Revolution servers.

Dual processor ready! Meaning, these systems deliver enterprise class power for the price of a departmental server.

But dual processing isn't all that sets these systems apart. DUAL redundant power supplies.* DUAL PCI bus technology. Error checking and correcting memory. One-Gigabyte system memory expansion. Numerous hot-spare storage subsystems and RAID solutions. And with both tower and rack-mountable configurations, these systems are ideal for a variety of network applications. Plus, ALR's "built-in" InforManager server hardware management provides the security you need to protect your sensitive, mission critical operations.

And if you need even more power, ALR's award-winning family of **QUAD** processing Revolution servers delivers the highest level of performance available on the PC platform to date.

Even ALR's service and support exceeds the norm. All these systems are backed by a 5 year/36 month warranty with a full 3 years of free on-site service. That's more the twice the coverage of most competitive systems.

With a choice of single or dual processing, these servers have the power you need at a price you can afford.

Seeing is truly believing. So, for the location of the ALR reseller nearest you, call: **1-800-444-4ALR** (ext# 5805)

ALR
Advanced Logic Research, Inc.

* Rackmount and Revolution MP Pro come standard with redundant power supply, optional on Revolution DUALS.

ALR is on the Internet - http://www.alr.com, CompuServe - GO ALRINC, & America Online - Keyword ALR

Advanced Logic Research, Inc. [illegible] Specifications subject to change without notice. Systems shown with optional equipment. Pentium based on U.S. Inc. ALR is a registered trademark of Advanced Logic Research, Inc. Product logo and third party logos are trademarks of Intel Corporation. All other brand and product names are trademarks or registered trademarks of their respective owners. * Some restrictions apply - consult ALR for complete details. © 1995 by ALR

Coming in the October 21 issue of Computerworld

Cutting Costs

with Integrated Network Management Tools

A

COMPUTERWORLD
CUSTOM PUBLICATIONS

White Paper

Where attempts to use traditional network management solutions across multiple platforms have led to problems, the use of integrated management tools has proven to be a significant multiplier to productivity. In this White Paper, International Data Corporation (IDC) details how management efficiency and productivity increase through the use of integrated network management tools that work across multiple platforms and management disciplines.

IDC cites improvements in efficiency, deployment, user administration, and ongoing network operations, and provides figures for savings based on IDC's model for measuring the return on investment of these solutions. This White Paper also discusses some of the problems organizations face in implementing management solutions as well as the benefits they can gain when these solutions are deployed successfully.

Written by:
IDC

Sponsored by:
Tivoli

☑ **Yes**, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Single copy price: $3.00/issue *U.S. Only. Canada $95. Mexico, Central/South America $150, Europe $295. all other countries $295

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/Transportation
70 Mining/Construction/Petroleum/ Refining/Agriculture
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
99 Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgt. /PC Mgr. Tech Planning, Administrative Services
23 Dir./Mgr. Sys. Development, Systems Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
60 Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner,General Mgt.
12 Vice President, Asst. VP
13 Treasurer,Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1 At this location	2 Entire Organization
A. 20,000 +	☐	☐
B. 10,000 – 19,999	☐	☐
C. 5,000 – 9,999	☐	☐
D. 1,000 – 4,999	☐	☐
E. 500 – 999	☐	☐
F. 100 – 499	☐	☐
G. 50 – 99	☐	☐
H. 20 – 49	☐	☐
J. 10 – 19	☐	☐
K. 1– 9	☐	☐

B4O8 Q

The Newspaper of Information Systems Management
COMPUTERWORLD
Everything you need to know.
Save over 73%

☑ Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Single copy price: $3.00/issue *U.S. Only. Canada $95, Mexico, Central/South America $150, Europe $295 all other countries $295

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/Transportation
70 Mining/Construction/Petroleum/ Refining/Agriculture
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
99 Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr. Tech Planning, Administrative Services
23 Dir./Mgr. Sys. Development, Systems Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
60 Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner,General Mgt.
12 Vice President, Asst. VP
13 Treasurer,Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1 At this location	2 Entire Organization
A. 20,000 +	☐	☐
B. 10,000 – 19,999	☐	☐
C. 5,000 – 9,999	☐	☐
D. 1,000 – 4,999	☐	☐
E. 500 – 999	☐	☐
F. 100 – 499	☐	☐
G. 50 – 99	☐	☐
H. 20 – 49	☐	☐
J. 10 – 19	☐	☐
K. 1– 9	☐	☐

B4O8 Q

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

97

CORPORATE
TECHNICAL
RECRUITING
CONFERENCE

COMPUTERWORLD

June 8 - 11, 1997

Marriott Rivercenter Hotel
San Antonio, Texas

Reserve your place at the hottest conference of the year.

Call 1-800-488-9204 for info

CAREER AGENT
careeragent.com
Have you seen your agent today?

BIG CRY *for* Smalltalk

The word is out for Smalltalk programmers: Hiring managers are really speaking your language. **BY LINDA WILSON**

Stephen Jacobs learned Smalltalk three and a half years ago while he was working on a sales and marketing application at Nortel, Inc. in Dallas. It turned out to be a smart career move.

Because he knew Smalltalk, Jacobs was recruited nine months ago for a job at BroadBand Technologies, Inc. in Research Triangle Park, N.C., a vendor of switched digital video equipment.

"An interesting byproduct [of learning Smalltalk] was this job, which started with a call from a headhunter at work," Jacobs says. He is originally from Atlanta and wanted to move back to the Southeast.

Jacobs' story isn't unusual in the world of Smalltalk, so object-oriented language developed at Xerox Parc in 1980. Because so few programmers know Smalltalk, those who do have no trouble finding jobs.

Mark Mojkowski is a perfect example. He received offers after each interview when he was looking for a position a year ago. He chose Kronos, Inc., a developer of automated time and attendance systems in Waltham, Mass., because he wanted to work on commercial products, not internal information systems.

Gaining ground

Smalltalk has been more of a niche language than C, C++ or Microsoft Corp.'s Visual Basic. But it's beginning to become popular in certain areas of the U.S., primarily in areas where the telecommunications industry is strong, such as Washington, Dallas and Atlanta.

For example, Source Services Corp., a Washington-area recruiting firm, had more than 200 openings for Smalltalk programmers in the first half of this year, compared with 77 openings in the same period last year.

Demand for C++ talent, on the other hand, is declining.

For the same period, Source Services had 140 C++ positions, down from 175 a year earlier, according to Paul Villella, managing partner at the company's Tyson's Corner, Va., office.

But in Dallas, demand for Smalltalk hasn't eclipsed C++. Companies that seek Smalltalk programmers are primarily in the telecommunications industry. They include Digital Switch Corp. and Sprint Corp., says Sean Napoles, a recruiter at DataPro Personnel Consultants, Inc. in Dallas.

NationsBank Corp. and Burlington Northern Santa Fe Railway also use Smalltalk, he says. Demand for Smalltalk programmers in Atlanta is limited to a few companies, but when positions become available, companies have a hard time filling them, says Tom Freeh, a managing partner at the Atlanta office of Source Services.

"The use of it is limited," Freeh says. "The object-oriented language of choice in the Southeast is Visual C++."

Hire first, teach later

If you're interested in learning Smalltalk, you should be able to find a position in which you can learn the language on the job. Because there are so few people experienced in Smalltalk, companies usually are willing to train experienced programmers after they hire them.

That's the situation at Kronos. The company has 10 programmers who work in Smalltalk and is looking for 10 more.

When Kronos began to use Smalltalk in 1994, it trained a team of four programmers internally. Then it hired additional people from outside the firm.

"We looked for people with Smalltalk experience, but it was very difficult," says Jack Rich, a senior software engineer at Kronos who was part of the initial Smalltalk team. "We did find a few."

But experience in software engineering doesn't guarantee success in Smalltalk, says Y. Renee Lewis, director of software engineering for strategic billing systems at Bell Atlantic Corp. in Arlington, Va.

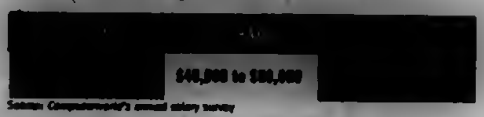
"We get a lot of Cobol guys that want to do [object-oriented programming.] Some of them have the aptitude for it, and some of them don't," Lewis explains.

Because Smalltalk is an object-oriented language in which reusable objects exchange messages, "it is a very good home for very creative thinkers who can look for patterns of behavior," Lewis says. "You need to be able to think in layers of abstraction." ■

Wilson is a freelance writer in Glen Ellyn, Ill.

BIG BUCKS FOR SMALLTALK

Typical salary ranges for IS professionals with Smalltalk skills:



Source: Computerworld's annual salary survey

FOR THE LATEST WORD ON SMALLTALK

Job resources on the Internet:

- st-www.cs.uiuc.edu/ftp/pub/Smalltalk/st-docs/smalltalk-jobs.txt
- www.smalltalk.com/jobbome.html
- comp.lang.smalltalk

For more information:

- University of Illinois at Urbana-Champaign Smalltalk archive: st-www.cs.uiuc.edu

Computer Careers

BIG CRY *for* Smalltalk

The word is out for Smalltalk programmers: Hiring managers are really speaking your language. **BY LINDA WILSON**

Stephen Jacobs learned Smalltalk three and a half years ago while he was working on a sales and marketing application at Nortel, Inc. in Dallas. It turned out to be a smart career move.

Because he knew Smalltalk, Jacobs was recruited nine months ago for a job at BroadBand Technologies, Inc. in Research Triangle Park, N.C., a vendor of switched digital video equipment.

"An interesting byproduct [of learning Smalltalk] was this job, which started with a call from a headhunter at work," Jacobs says. He is originally from Atlanta and wanted to move back to the Southeast.

Jacobs' story isn't unusual in the world of Smalltalk, an object-oriented language developed at Xerox Parc in 1980. Because so few programmers know Smalltalk, those who do have no trouble finding jobs.

Mark Mojkowski is a perfect example. He received offers after each interview when he was looking for a position a year ago. He chose Kronos, Inc., a developer of automated time and attendance systems in Waltham, Mass., because he wanted to work on commercial products, not internal information systems.

Gaining ground

Smalltalk has been more of a niche language than C, C++ or Microsoft Corp.'s Visual Basic. But it's beginning to become popular in certain areas of the U.S., primarily in areas where the telecommunications industry is strong, such as Washington, Dallas and Atlanta.

For example, Source Services Corp., a Washington-area recruiting firm, had more than 200 openings for Smalltalk programmers in the first half of this year, compared with 77 openings in the same period last year.

Demand for C++ talent, on the other hand, is declining.

For the same period, Source Services had 140 C++ positions, down from 175 a year earlier, according to Paul Villella, managing partner at the company's Tyson's Corner, Va., office.

But in Dallas, demand for Smalltalk hasn't eclipsed C++. Companies that seek Smalltalk programmers are primarily in the telecommunications industry. They include Digital Switch Corp. and Sprint Corp., says Sean Napoles, a recruiter at DataPro Personnel Consultants, Inc. in Dallas.

NationsBank Corp. and Burlington Northern Santa Fe Railway also use Smalltalk, he says. Demand for Smalltalk programmers in Atlanta is limited to a few companies, but when positions become available, companies have a hard time filling them, says Tom Freeh, a managing partner at the Atlanta office of Source Services.

"The use of it is limited," Freeh says. "The object-oriented language of choice in the Southeast is Visual C++."

Hire first, teach later

If you're interested in learning Smalltalk, you should be able to find a position in which you can learn the language on the job. Because there are so few people experienced in Smalltalk, companies usually are willing to train experienced programmers after they hire them.

That's the situation at Kronos. The company has 10 programmers who work in Smalltalk and is looking for 10 more.

When Kronos began to use Smalltalk in 1994, it trained a team of four programmers internally. Then it hired additional people from outside the firm.

"We looked for people with Smalltalk experience, but it was very difficult," says Jack Rich, a senior software engineer at Kronos who was part of the initial Smalltalk team. "We did find a few."

But experience in software engineering doesn't guarantee success in Smalltalk, says Y. Renee Lewis, director of software engineering for strategic billing systems at Bell Atlantic Corp. in Arlington, Va.

"We get a lot of Cobol guys that want to do [object-oriented programming.] Some of them have the aptitude for it, and some of them don't," Lewis explains.

Because Smalltalk is an object-oriented language in which reusable objects exchange messages, "it is a very good home for very creative thinkers who can look for patterns of behavior," Lewis says. "You need to be able to think in layers of abstraction." ■

Wilson is a freelance writer in Glen Ellyn, Ill.

BIG BUCKS FOR SMALLTALK

Typical salary ranges for IS professionals with Smalltalk skills:

MID-ATLANTIC	SOUTHWEST	WEST
$80,000 to $70,000	$40,000 to $60,000	

Source: Computerworld's annual salary survey

FOR THE LATEST WORD ON SMALLTALK

Job resources on the Internet:

- st-www.cs.uiuc.edu/ftp/pub/Smalltalk/st-docs/smalltalk-jobs.txt
- www.smalltalk.com/jobhome.html
- comp.lang.smalltalk

For more information:

- University of Illinois at Urbana-Champaign Smalltalk archive: st-www.cs.uiuc.edu

C & C++
Multimedia Cyber Classroom
Prentice Hall — Professional Technical Reference, Saddle River, N.J.
Price: $69.95
www.prenhall.com

C++ training CD-ROM could benefit from a book

Excellent material tries to satisfy too many skill levels

By Jeffrey Gordon Angus

It's no pithy revelation that programmers who want to enhance their careers would do well to learn C++. But how to do it? Evening classes chop up material in pieces convenient for the schedule, not to optimize learning — function follows form. Classes aren't always available, and when you can crowbar your way into one, you can't count on a capable teacher.

The logical counterattack is to use one of the many trade books that overpopulate bookstores. They let you create a self-paced course. But it's gotten hard for consumers and publishers alike to differentiate among any of the cascade of C++ titles.

One recent offering has gone multimedia and interactive in an attempt to get noticed, with mixed results. Although many books include a CD-ROM to add dimension to what print can communicate, Prentice Hall PTR's "C & C++ Multimedia Cyber Classroom" skips the book entirely.

This lack of a printed book is one of the product's two noteworthy shortfalls. The computerized format limits the amount of text on any page, which is fine for the attention-deficit crowd. But almost all potentially successful programmers have at least average attention spans. FrameViewer, the hypertext authoring tool with which the text was set up, imposes several navigational blocks and nonstandard Windows features. You can't use arrow or function keys to turn pages, and because the pages are so small, you'll be turning them a lot. And if you double-click on a choice in a dialog box, it doesn't trigger anything.

The other stumble is that the content tries to please too many audiences — nonprogrammers and programmers who may or may not know C. The authors, Harvey and Paul Deitel, do a valiant job trying to help each target user figure out what to do, in what order. But Marketing 102 teaches that if you try to be all things to all people, you end up being of little value to anyone.

This almost qualifies as tragedy because the authors, a potent father-and-son combination, have constructed and beautifully cross-referenced a structured coding approach to learning C++. The examples are clear and readable, and they have designed picture-coded buttons to take you to optimization hints, gotchas and other categories. They have personality (actually, a pair of contrasting personalities that give you a point/counterpoint view of many issues), and they are very thorough.

Unlike so many "multimedia" titles, this one is effective in using audio and video to reinforce the material. For example, the authors use audio narration to paraphrase the topic being covered. This helps the third of the population that learns primarily by hearing, and the audio code remarks can be very useful.

I want to like this title. At $69.95, it's significantly less expensive than the three evening classes it would require to cover the contained course work. I like its structured coding approach, its attitude and the extensive material. But it could have been so much better. With a little interface work and a clearer consumer focus, this title could have been broken down into two or three more specific titles for nonprogrammers, programmers who don't know C and C programmers who don't know C++. ■

Angus is a systems analyst at The Data Works Ltd. in Seattle.

Measuring your IS leadership potential

Every year, I hold more than 200 career counseling sessions for programmers and other information systems technicians at more than 40 locations across the country. Each individual and each situation is different, but at more than 75% of the sessions, I will invariably hear the same statement: "I want to be a manager."

Too often, those who say this have no idea what it means to be a manager. They may have only a vague feeling that "unless I'm a manager, I'm not going to get anywhere in this organization."

To understand how far you can advance in the IS organization, you need to understand the difference between being an effective manager and being a real leader.

IS leaders are creative and quick-thinking. They can assemble a project team, get the confidence of team members and take projects to satisfactory completion. They get diverse team members from IS and business units to understand and embrace the same goals.

IS leaders understand and accept the business goals of the organization without following the path of least resistance — a delicate balance.

Successful IS leaders must genuinely like working with people. They should possess a strong intuitive sense about the people on their team — both the IS professionals and business users — and how they will perform in given situations. A good leader has learned not to take criticism personally and can counsel friends on matters they don't want to hear.

Beating the odds

The plain truth is that perhaps only one IS professional in 10 has what it takes to become either a good leader or a good manager. The best and most rare — and the ones most likely to rise highest in the organization — combine traits of both.

I met one such rising star last year when a new technical employee walked into my office.

Although his resume showed years of experience on various mainframe projects around the world, there was little there to indicate management experience. Yet almost immediately you could sense this was someone ready to rise to the top.

He had a genuine desire to work with people and to get things done. He had an aura of confidence — something that is far different than charisma, which can be found at virtually any competence level.

As the months passed, this employee was selling the client on new electronic data interchange and other projects, and his internal managers were all enthusiastic about his work. He not only looked like a leader, he worked like one. At the same time, he enthusiastically mastered all the management tasks, such as regular reports to headquarters, that are necessary to keep any organization moving and to free him to exercise his leadership capabilities. The trick with such employees isn't so much to develop them, but to find the right promotion for them soon enough.

Power outage

Just because you are technically, but not managerially, competent isn't the end of the world. Pushing for jobs simply because they offer more power or prestige is often a sure path to career disaster.

I came face-to-face with this fact early in my career as a human resources manager. Against my better judgment at the time, I went along with the promotion of a gifted technologist. His motivation for advancement was more for the perks of office than the substance. He didn't want to listen to subordinates, let alone counsel them. And he turned up his nose at the paperwork that goes along with management.

Not only were his subordinates unhappy — and actively applying for transfers — so was he. His failure to create a true IS team led to all kinds of problems. The worst result, from his perspective, was the erosion of his own technical skills.

Like many other would-be IS managers, he hadn't grasped how much maintenance of technical sharpness depends on day-to-day, hands-on activity. And, as it turned out, technology was really his first love.

Happily — and none too soon — the manager was persuaded to return to his previous role as technologist, where he ended up rebuilding a solid career. In fact, most first-class companies have made a point of creating career tracks where heavy-duty technologists receive just as much money or more than managers — not to mention a good degree of power and prestige. ■

Grey is director of operations at Complete Business Solutions, Inc., a computer systems integrator and software development company in Farmington Hills, Mich. Her Internet address is JGrey@cbsibg.cbsinc.com.

TECHNICAL OPPORTUNITY

VHA Inc. is a [illegible] company serving 1,300 [illegible]. VHA provides [illegible] to help these organizations [illegible] clinical quality and operational efficiency. We are currently seeking a LAN Specialist II for our corporate headquarters located in Dallas, Texas.

LAN SPECIALIST II
LOTUS NOTES

REQUIREMENTS INCLUDE:

- Strong Lotus Notes experience required; NetWare 3X & 4X, and Windows 3.1 also required
- WordPerfect 6.1 and Microsoft Office Suite of products required
- Experience with first line troubleshooting
- GroupWise, OS/2, WIN '95 and Internet experience a plus
- Degree required or experience may be substituted on a year-to-year basis.

We offer an excellent compensation and benefits package. Submit resume and salary requirements to: VHA Inc., Attn: Req #105, P.O. Box 140909, Irving, TX 75014 or fax to (972) 830-0195. For information on other available positions call our 24-hour jobline at (972) 830-8777.

VHA

e-mail address: jobs@vha.com

United to Improve America's Health®

EQUAL OPPORTUNITY EMPLOYER

Computer

Do you possess above average skills?

Andersen Consulting is an international management and technology consulting organization whose mission is to help its clients change to be more successful. The organization works with clients from every industry to integrate their people, processes, strategies and technologies. **The Center for PeopleSoft Solutions (CPSS)**, located in Minneapolis, Minnesota, works with Andersen Consulting industry teams to provide clients with custom solutions based on PeopleSoft's product line. CPSS brings together the best industry expertise and highly skilled consultants to develop world-class business solutions using PeopleSoft HRMS and Financials applications.

CENTER FOR PEOPLESOFT SOLUTIONS

Andersen Consulting values professional growth and recognizes that providing a variety of career directions benefits our people and our clients. The following positions are available within CPSS.

Development Analyst—Become an expert at customizing PeopleSoft panels and processes using PeopleSoft's development tools including PeopleTools, SQL/SQR, PeopleCode.

Design Consultant—Become a leader at designing and building the best solutions using PeopleSoft's HRMS or Financials applications.

Project Manager—Manage a team of analysts and consultants dedicated to providing the best business solutions for clients implementing PeopleSoft HRMS or Financials applications.

Technical/Installation Support Analyst—Responsible for setting up databases, application software and workstations for the PeopleSoft products in the Center for PeopleSoft Solutions and at client sites.

Instructional Technology/Instructional Design Consultant—Join a team in designing and building the best learning and support solutions for client implemented PeopleSoft HRMS or Financials applications.

You may be the candidate we are seeking if you possess **at least one** of the following:

- Experience with PeopleSoft Financials and HRMS modules.
- Technical background in PeopleTools, PeopleCode, PS Query.
- Experience with PeopleSoft technical support, installation and upgrades. UNIX experience.
- Experience with technology based learning solutions.

If you possess these skills and want to join a fast-growing, leading edge group of professionals, please fax 612-334-4710 or forward your resume in confidence to: Recruiting Department - CPSS, Andersen Consulting, 45 S. 7th St., Mpls, MN 55402. Please reference Job #PS-100696-03. Andersen Consulting offers a comprehensive salary and benefits package, excellent training, and unparalleled opportunities for career growth. For more information, contact us at: http://www.ac.com

ANDERSEN CONSULTING

Andersen Consulting is an Equal Opportunity Employer.
©1995 Andersen Consulting

Linking

INNOVATION and SUCCESS

At ACI, our innovative technological solutions create success for leaders in business, industry, and government. Our high standards of technical excellence also create the perfect environment in which to build a successful career. One with challenging projects, and up-to-the-minute training program and opportunities for long-term professional growth. Currently, we're looking for innovative professionals who possess the following skills:

[redacted]

To learn more about joining ACI's respected and technically advanced team, send, fax or e-mail a resume to: ACI, Dept. CW 10/14, 8770 West Bryn Mawr, Chicago, IL 60631. Fax: (312) 380-4227. E-mail: aciecruit@autocon.com. Phone: (312) 380-4200. EOE.

You can also visit us on our website at: http://www.autocon.com

aci automated concepts incorporated

Design-Synergy Corporation

[redacted]

Design-Synergy Corporation is a leading provider of IS Consulting Services in Cincinnati. We are expanding our staff and services to better support our clients. We provide outstanding career opportunities for our employees supported with a team atmosphere. Our goal is to provide premium services with the highest caliber of employees while maintaining the utmost level of integrity with our clients and employees. We are ready to hire qualified professionals. Please mail, fax, or e-mail your resume to the address below.

DESIGN-SYNERGY CORPORATION
635 W. Seventh St., Suite 105
Cincinnati, OH 45203
Phone: 513-333-6363. Fax: 513 333-6364
http://www.design-synergy.com

Search Computerworld's Archives

www.computerworld.com

COMPUTERWORLD
The Internet Connection for the IT Community

Test engineer design & build test s/w & h/w using Visual C++ & Visual Basic programming; design & implement Local Area Network (LAN) comprised UNIX & Windows NT Servers using MS mail/office s/w; implement & analyze test for vehicle brake & throttle control system; maintain h/w by applying knowledge to router, bridge, hub topologies, 10BaseT & TCP/IP. Req MS in computer engineering, engineering, 1 yr exp in job offered or related as research assistant or programmer or administrator related exp include using Novell Netware & D Base-III, installing & maintain s/w for IBM PC 486/dx4, 8-5pm, $62K 48/wk. Send resumes to 7310 Woodward Ave Rm 415, Detroit, MI 48202 Ref No 113066. Employer paid ad.

SDS

An Information Technology Firm

Permanent and contract positions are currently available throughout the Southeast. Any and all skills are of interest to us:

- CLIENT SERVER
- MAINFRAME
- MIDRANGE

Excellent compensation and benefits, training, relo. assistance, and 401-K. Call or write today: SDS, Inc., 4600 Park Road, Suite 109, Charlotte, NC 28209.

Why is Programming Alternatives the Right Alternative?

- **Excellence**- Our reputation for excellence is unmatched in the industry
- **Options**- We offer a wide range of employment options: consulting, permanent, & consulting with client option to hire. Sub contracting opportunities available
- **Benefits**- Competitive compensation & flexible benefits, including 401(k), medical, dental insurance, and more
- **Opportunities**- Multiple industry applications - manufacturing, financial services, distribution etc

SMALLTALK
Architects & Developers

- Digitalk/Parcplace
- Envy
- VisualAge
- WindowBuilder/PRO

Programming Alternatives.
The Right Alternative.

Fax resume to: Programming Alternatives, 6750 France Ave S, Suite 144, Minneapolis, MN 55435. EOE/AA.
(612) 922-1103 Fax: (612) 922-3726
E-mail: resume@pami.com

Programmer Analyst - Plan, develop, test & document computer programs, applying knowledge of programming techniques & computer systems; evaluate user request for new or modified program, determine feasibility, cost & time required, consult/clarify with current system & computer capabilities, consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design; convert project specifications using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by computer. The intended responsibilities include systems management, database administration & using a wide variety of hardwares, softwares & languages including, but not limited to, IBM 3090 IMS DB/DC, ADF, MARK IV, CROSSTABS & Knowledgeware ADW. Reqs. Bachelor's in Computer Science, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equivalent in ed. & exp. & 2 yrs. exp. in the job offered & 2 yrs. exp. in a related occup. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 2 yrs. of college and/or post-secondary vocational school ed. plus & yrs. exp. in the job offered or in a related occup. in lieu of the required ed. & exp. Must have some related exp. which included systems management, database administration & using each of the following: IBM 3090, IMS DB/DC, ADF, MARK IV, CROSSTABS & Knowledgeware ADW. $50,000/yr., 40 hrs/wk, 8a-5p, M-F. Send resume to 7310 Woodward Avenue, Room 415, Detroit, MI 48202. Include Ref #98589. Employer Paid Ad.

WANTED: Data Base Analyst to provide technical analyses and design of Oracle data bases and related on-line application programs and network utilizing Novell, Unix and MVS; provide technical guidance and assistance to user departments; develop security and efficiency procedures for use of data base systems, design/implement customized data base access techniques and recovery and restart procedures; select appropriate data base storage strategies for customers. MS in Statistics or Computer Science required. 2 1/2 year's experience in job or as Systems Programmer, Research Analyst, or Customer Engineer required. Must be resident of Chicago. Uses Oracle and Pro*C, Data Bases and C-languages. Must have completed at least 15 credit hours in MIS including case tools and repository management. 40 hours per week, 8:30 a.m. to 4:30 p.m. $58,900 per year. Must have proof of legal authority to work permanently in the U.S. Applicants should send 2 copies of both resume and cover letter or Illinois Department of Employment Security, 401 S. State St., 3 South, Chicago, Illinois 60605. Attention: Lani Bolles, Reference # V-IL 14683-Z. an employer paid ad. No calls.

PROGRAMMER ANALYST - Plans, develops, test and document computer programs applying knowledge of programming techniques and computer systems. Consults with user or identify current operating procedures and clarify program objectives. Evaluates user request for new or modified programs. Formulates plan outlining steps required to develop program, using structured analysis design. Prepares flowcharts and diagrams to illustrate sequence of steps program must follow and or describe logical operations involved. Utilize advanced system and database design methodologies like SLC (Systems Life Cycle) for each phase of system development and implement tools including IBM 3090, IBM-PCs (XT & AT), MVS/ESA, MVS, UNIX, Microsoft DOS, OS/2, DB2, DATACOM/DB, XDB, Database design & administration installation configuration and performance monitoring and tuning of ORACLE 6.0, databases, SQL*Forms V3.0, PL/SQL INFORMIX, I-4GL, ACE, FORMS, SQL UNIFY on ACCELL Environment, Oracle*-CASE, MVS/JCL, MICROFOCUS WORKBENCH, SAS INTERTEST, CCS TEST, SMART TEST, XPEDITER/TSO COBOL II, C, PASCAL, LISP and ASSEMBLY Bachelor's in Computer Science or Computer Application. Must have 2 yrs exper as Programmer Analyst including 1 yr exper designing software systems for business application functions using IBM 3090, MVS, ISPF, TSO, IMS/DC, DB2, COBOL II, ADW, MICROFOCUS WORKBENCH, XDB, SPF/PC, SAS, XPEDITER and utilizing SLC methodology. 40hrs/wk, 8-5, $53,000/yr. Send resume (no Calls) to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 Job # 123498 "Employer Paid Ad."

Consultant: Consult with clientele regarding their particular needs and provide professional advice regarding systems and applications that are of particular value to clients' business needs; design, technical development, coding and testing of client-server database systems; provide technical expertise in the implementation of computer applications, as well as technical assistance or programmers; perform data analyses, and subsequently design models for database implementation; duties include developing GUI systems, conducting relational database development; Windows API, Foxpro, Xbase and SQL database programming and use of Visual Basic and VBXs; design and implement Windows Help Systems. Four years experience in the position required. Must possess experience developing GUI systems, conducting relational database development; Windows API, Foxpro, Xbase and SQL database programming and use of Visual Basic and VBXs; Windows Help Systems development. 40 hrs./wk; 8:00 a.m. - 5:00 p.m.; $43,000 year. Must have proof of legal authority or work in the United States. Send your resume or the O.E.S. Workforce Center, 215 Keo Way, Des Moines, Iowa 50309-1727. Please refer to Job Order IA11002545. Employer paid advertisement.

Programmer/analyst (Sr Consultant) Dev & implement production, dist. & financial applications s/w (eg, as Purchasing Material Resources Planning, Work-in-Process, Bills of Material, Capacity Resource Planning & inventory control) Specify reqs, transform reqs. into detailed designs & write code. Design & dev solutions in client/server architecture using RDBMS, 4GL tools & C prgrmming under Unix. Set up networks among various operating systems. Must have BS in Computer Science or Electrical or Electronic Engineering & 2 yrs exp. in job offered or developing information systems using RDBMS, 4GLs, financial applications s/w, Unix prgrmming, TCP/IP & C or Pro*C prgrmming. More than 70% travel thruout Texas & the U.S. $4800/mo. Home office/interview site in Irving, TX. Apply or the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778. JO# TX7855853. Ad paid by an Equal Opportunity Employer

System Analyst, R&D telephony products, focused on enhanced services in both h/w & s/w; install, configure & maintain ESP service platform, providing customized switching, billing & call-processing features, comprising VCO-80/Portico, Ingate Voiceplatform, 9620 NEBS/CO chasses & MAXserver 1608; monitor & analyze traffic on SS & networks with Intel TURBO-1; design & develop Object-Oriented s/w in SPARC20 Solaris 2.4 operating environment, using FUSION methodology, SunSoft WorkShop facilities, ObjectSystems library, PURE s/w evaluation kit & VISIO 4.0 documentation tool; develop ISDN applications with RLT function for UCS DMS-250 switch, including SDS programming with ASIST/API. Req. MS in computer science or Electrical Engineering, 2wks training Object-Oriented Analysis & Design, 6mo exp in job offered or related as Programmer or Research Assistant, related exp include object-oriented programming and design network installation and configuration 40hrs/wk, 8-5pm, $41,810/yr. Send resumes or 7316 Woodward Ave. Rm 415, Detroit, MI 48202 Ref No 121096 Employer paid ad.

Systems Analyst, 40 hr/wk from 9am to 5pm $40,000/yr. Analyses, design and development of Commercial Application Systems as Mainframe using CASE Tools and DB2. Must work will be done as IBM Mainframes using MVS/XA, ESA, DB2 TELON, ACF, XPEDITOR and CASE TOOLS. Require 2 years experience in job offered or as Computer Programmer or as Software Specialist including one year of work with IBM Mainframe, MVS/XA or ESA, DB2, CICS, TELON ACF, XPEDITOR and any CASE TOOL. Must have proof of legal authority to work permanently in the U.S. Please send resumes to Illinois Department of Employment Security, 401 South State Street-3 South, Chicago, Illinois 60605. Attention: Janet Aschenbrenner. Reference #V-IL 15774-A An Employer Paid Ad No Calls. Send 2 copies of both resume and cover letter.

System Analyst: design & develop GUI for Fastener Tightening System (FTS) using Borland C++, Allen Bradley PLC-5, Wondereware, Ethernet and MS Access as well as to load parameter from PC to PLC and perform data acquisition & statistic process control; develop Response Emulator in C applying skill of C, graphic library, RS232 Serial Port communication programming, RT-Kernel, TM/IO, Coprocessor, repair PC & troubleshooting UNIX network. Req. MS in computer science; 1yr exp in job offered or related as programmer, related exp include developing GUI in Borland C++ & Allen-Bradley PLC, repairing PC & troubleshooting UNIX network. 40hr/wk, 8-5pm, $20.65/hr. Send resumes to 7310 Woodward Ave. Rm 415, Detroit, MI 48202 Ref No. 108386 Employer paid ad

PROGRAMMER/ANALYST Design, analyze, develop and launch of client server/knowledge base systems. Duties include capturing of project requirements, system development using SUN (UNIX based) servers, C, C++, Sybase, DB2, UNIX Shell scripts, Windows, GUI tools using OO object oriented techniques. Launch and integrate with existing systems as client network running Novell, Windows and Sybase, TSO, OMF and ISPF tools as mainframe. Must also design client systems using OO design and Expert systems. Salary, $23.25 per hour, 40 hr week (8:00 a.m. - 5:00 p.m.). Requirements, M.S. degree in Computer Science & Electrical Engineering with 6 months experience as a programmer/analyst or include design and development of systems using C, Sybase on SUN (UNIX based) server, DB2, RDBMS, Novell networks and Windows. Applicant must have completed one graduate level course in Expert Systems and one graduate level course in Object Oriented Languages. Send Resume to: MESC, 7310 Woodward Ave., Rm 415 (Ref #125796) Detroit, MI 48202, employer paid ad.

http://careers.computerworld.com

At Owens-Illinois, we've become one of the world's leading manufacturers of packaging products through our technical leadership. And as we continue to provide our clients with a wide variety of materials, products, services and manufacturing processes, we need the expertise of professionals like you.

DATABASE ADMINISTRATOR

You will design physical and logical database models, as well as ensure data integrity and performance through copy management, backup and recovery procedures.

We require an Associate's Degree (a BA is preferred) or some business schooling, and experience with Sybase DBA on System 10, Sybase Replication Server, IBM RS6000, SQL Backtrack, Sybase System 11 and distributed multiple server environments. Data modeling skills and a knowledge of SQL are a must, as is UNIX experience and familiarity with Artisan DBA tools. We prefer Sybase DBA certification.

We offer a competitive salary and comprehensive benefits. For consideration, please forward a resume to: **Gary Schaaf, Owens-Illinois, One Seagate, Toledo, OH 43666.**

O-I

Equal Opportunity Employer

Start your day...

COMPUTERWORLD

The Internet Connection for the IT Community

www.computerworld.com

CONSULTANTS

And you will be recognized throughout the technical industry! SEEK Consulting, an Inc 500 company, is a rapidly growing full-service contract placement firm. We are market savvy staffing specialists, providing consultants with exciting opportunities at leading-edge companies. Whether you are a career-minded systems professional seeking a challenging assignment or a hiring manager in need of top quality consultants, SEEK Consulting is your voice in today's marketplace.

SOS SEEK OUT SEEK

SEEK

A SAMPLING OF CONSULTANT OPPORTUNITIES AVAILABLE IN THE U.S.:

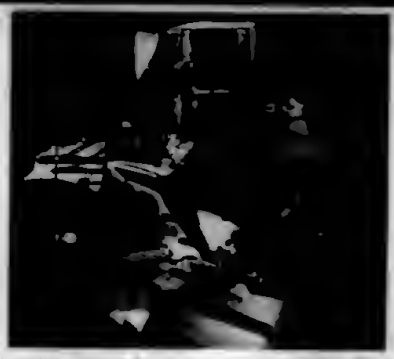
- VC++, MFC, NT, ActiveX
- Powerbuilder 4.0/5.0
- Delphi, Versions 1 and 2
- Data Warehousing
- Oracle Financials (AR, AP, GL, INV)
- Oracle/Sybase DBAs
- Peoplesoft HRMS, Financials, Manufacturing
- C, C++, UNIX, Networking
- UNIX System Administrators
- MS-Test, SQA Team Test
- UNIX Testers, Loadrunner, X-runner
- OLTP, Tuxedo
- C, Assembly, PSOS
- GSM, TDMA, CDMA, PHMA, CDPD

SEEK our technical opportunities and competitive rates by sending your resume to: SEEK Consulting Group, Inc., Attn: Dept. CW, 401 Edgewater Place, Suite 130, Wakefield, MA 01880; Phone: (800) 274-1174; FAX: (888) 777-SEEK (7335); Internet: jobs@seek-consulting.com

We are an equal opportunity employer

http://seek-consulting.com

Technical Solutions, Global Impact



Ryder's explosive growth in the integrated logistics industry has created immediate opportunities for creative, customer-focused Information Technologists. As we redefine the leading-edge with innovative solutions designed to enable our customers to streamline their operations and reduce their costs, our IT team members are engaged in exciting global initiatives. Be part of shaping the future of the booming logistics industry in one of these immediate openings:

DATA WAREHOUSING/DATABASE ADMINISTRATION/DATA ADMINISTRATION
Using CASE tools and a variety of DBMS.

APPLICATIONS DESIGN/DEVELOPMENT
Full software life-cycle development using a variety of tools including COBOL/DB2, IMS DE/DC, Powerbuilder/Visual Basic, C/UNIX/DBMS, RPGIII, GUI/Windows, etc.

TEAM LEAD/SYSTEM ANALYST
Full software life-cycle development with lead or senior analyst responsibilities.

TECHNICAL SUPPORT
Variety of platform and levels of responsibility: IBM Mainframe, IBM Midrange, Client/Server/LAN, UNIX/AIX, LAN/WAN, Communications.

PROJECT MANAGEMENT/METHODOLOGY
Planning and managing project and human resources to drive software projects.

TECHNOLOGY ASSESSMENT/ ARCHITECTURE/MODELING
Enterprise wide assessment, research and integration of information technology.

PROJECT/SOFTWARE IMPLEMENTATION/DEPLOYMENT
Deployment of new systems to support either internal or external customers.

ADMINISTRATIVE/CLERICAL/ SECRETARIAL RECEPTION

A fortune 250 leader with over $5-billion in revenues, we offer competitive compensation and excellent benefits. All resumes sent to Ryder are optically scanned into a sophisticated electronic database which gives all of our recruiters access to your qualifications, thereby increasing your opportunities within all divisions of the company. To speed input to our system, you should send your resume via the internet in text format to the following address: ryderJobs@aol.com

If this is not possible, you can fax your resume (avoid using non-standard type, excessive underlining, bolding or italicizing and heavy colored paper) to 305/500-4974. Otherwise, submit your resume on white bond paper with standard type to Ryder System, Inc., P.O. Box 025600, Miami, FL 33102. An EOE. Drug testing is a condition of employment with Ryder.

For more details about the above and additional opportunities at Ryder, see the following sites on the internet:
http://www.ryder.inter.net/ryder
http://www.occ.com/ryder/
http://www.careermosaic.com

Ryder®
MIS Technology

VIDEO NETWORK ANALYST

Position Vacancy

Mississippi State University Systems & Networks is seeking applications for a full-time Video Network Analyst position. This position will be involved in installation, maintenance, & support of the University's video network infrastructure, as well as coordination & scheduling of network resources that support video conferencing & classroom activities. These activities focus on the MSU campus network as well as wide area video network activities.

Minimum Acceptable Qualifications:
- A Baccalaureate degree
- Installation & support experience with VTEL compressed video equipment
- Experience using & supporting digital T1 communication facilities
- Setup & configuration experience with T1 CSU/DSU equipment
- Experience troubleshooting problems with local & wide area communication facilities
- Experience in configuring & programming a VTEL video switch, or MCU
- Experience in using a Microsoft Windows &/or Macintosh computer
- Well-developed interpersonal communication skills

Additional Desirable Qualifications:
- Experience with the Internet & TCP/IP
- Experience with the ISDN
- Familiarity with fiber optic & category 5 cabling systems
- Experience with advanced networking technologies such as Frame Relay & Asynchronous Transfer Mode (ATM)

The primary responsibility of this position is to provide support for the University's emerging video network infrastructure. Systems to be supported at MISSISSIPPI STATE UNIVERSITY include both campus facilities interconnected via a fiber optic backbone as well as remote, facilities connected via wide area telco facilities such as leased line T1. Salary commensurate with qualifications & experience.

Mississippi State University

Send resume, salary history/requirements, names & telephone numbers of three professional references to: Mr. Billie Reddoy, Director of Systems & Networks, Mississippi State University, P.O. Box 9687, Mississippi State, MS 39762

Applications will be accepted through November 15, 1996 or until position is filled.

SAP

WORLDWIDE IMPLEMENTATIONS

ALL MODULES
Functional • Technical
ABAP • BASIS
Positions throughout the U.S.

Structured Logic Company, Inc.
5200 Interstate N. Pkwy. #450
Atlanta, GA 30328
800/599-9550
FAX: 770/937-0423
e-mail: slc11@aol.com
EOE MEMBER NACCB

MIS Programmer (Two openings). Trouble shooting RS6000 based store systems with UNIX platforms. Support "C" and "COBOL" code in stores. Design, develop, implement, test and support object-oriented client/server application for the distribution systems users. Targeted environments are MicroSoft Windows with a Sybase database on UNIX platform. Provide support for User's request for enhancements/modifications to object distribution management system. Develop GUI applications with IEF Case Tool. BA/BS in Computer Science or equivalent; min. 1 yr of exper in Rapid Application Development for Graphical User Interface for client/server platforms using the IEF/Composer Case Tool. Min. 1 year of exper. in COBOL, C, Visual Basic and MicroSoft Windows-based programming. Min. 1 year of exper in UNIX, SQL, IBM OS/2 Warp, MicroSoft Windows 3x/95 platforms and relational databases including Sybase, MicroSoft FoxPro and Access. Min. 6 months of exper in local and wide-area networks running Novell and TCP/IP protocols (above experience may be obtained concurrently in other educational or work setting). $30,000 per year (with fluctuating workweek overtime compensation for hours over 40). 8a.m. to 6p.m. Apply to nearest Job Service office or submit resume (with Soc. Sec. #) to Job Service, Midtown Plaza, 320 Willesboro Avenue, North Willesboro, NC 28659. References Job Order # NC2660269 and DOT code 030.162-010.

MS Computer Science

For Life, Work and Academic Experience Match your skills with a legal degree and transcripts.

"No one knows experience is still the best teacher... But degrees open doors."

Degrees for people who want to be more effective and secure in their Jobs or Professions.

Earn your **BACHELOR'S, MASTER'S** or **DOCTORATE** degree in **Computer Science** via the Internet. Complete all your requirements on-line or through correspondence.

Design Your Own Emphasis Including:
- ***LAN Administration***
- ***C++/ Visual Basic Programming***
- ***Web Site Design***
- ***Over 300 others***

For over 20 years, we have successfully assisted our students to complete degree programs in their spare time, without formal classes or seminars.

Send detailed resume on work, life and academic experience for a **FREE EVALUATION.**

http://www.pwu.com
Admissions@pwu.com

Pacific Western University
(800) 423-3244, Ext. 9 Fax: (310) 471-6456

Engagement/ PROJECT MANAGERS

As a leader in providing systems integration, project management and outsourcing services in the Banking/Financial industry, our impressive growth rate has created some exceptional career opportunities.

We are currently looking for PROJECT MANAGERS and ENGAGEMENT MANAGERS whose principal areas of responsibility will be customer satisfaction, through effective project and client management. Applicants should be knowledgeable in application development and maintenance and have a successful track record in managing large projects. Experience in the Banking/Financial sector a plus. There are critical senior level positions involving extensive client interaction, team building skills, and resource management capability. Positions do not require relocation, but will require travel.

For immediate confidential consideration, please send a resume to Atlantic Data Services, Inc., One Batterymarch Park, Attn: HR, Quincy, MA 02169. Fax: 617-689-1103. e-mail: ads@ultranet.com

A·D·S
ATLANTIC DATA SERVICES, INC
An equal opportunity employer.

PCS GROUP/ROMAC INTERNATIONAL, a publicly traded company, is experiencing spectacular growth. This achievement has created unlimited opportunities for IS professionals with at least two years experience with the following technologies:

CLIENT SERVER
• SYBASE • POWERBUILDER
• ORACLE • DELPHI • C++ • LOTUS NOTES

MAINFRAME
• COBOL • CICS • DB2 • IMS

OTHER
• AS/400 • NETWORK ADMINISTRATION

Individuals who thrive on challenges and a fast-paced environment are encouraged to join us on the leading edge. Openings exist for both full-time and contract employees. ROMAC offers outstanding fringe benefits including stock options and 401(K), training, relocation reimbursement, and performance bonuses.

Please send resume to:

PCS GROUP/ROMAC INTERNATIONAL
PHONE: 800-682-9784 or 502-339-2900
FAX: 502-339-2688
ELECTRONIC ADDRESS
E-MAIL: infolou@romac.com

Equal Opportunity Employer

Information Technology Consultant responsible for utilizing state-of-the-art object orientation graphical user interface capability of programming, client/server applications development; involvement in all phases of project life cycle, from project planning through systems implementation; project management; performing technical services; assisting in the development of customer information systems; utilizing Windows, OS/2 Presentation Manager and DB2 in the development of client/server systems; assisting in the analysis of client/server strategies for integrating Windows, Unix, OS/2, and MVS platforms using DB2, Oracle, and SQL Server; performing data modeling using Bachman, database design, and database administration on DB2 and SQL Server; providing systems and design, programming and testing services; and assisting in the development and performance analysis of voice response systems. Must have B.S. degree in Computer Science or Electrical Engineering with one year of experience in job offered or one year of experience as a Programmer Analyst; education or experience must have involved utilizing Windows, OS/2 Presentation Manager, DB2, Visual Basic, PC based UNIX, TCP/IP, and MVS platforms; programming in C++, and providing Internet services, such as World Wide Web. 40 hours, 8:30 a.m. to 5:00p.m. $37,000 per year. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to the Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Sheila Lindsey. Reference # V-IL 15484-L. No Calls. An Employer Paid Ad.

Software Engineer - PC Networking/Sys. Admin. & Appl. Integration: Utilizing broad, of networking technologies, networking technologies & PC architecture install, configure & manage physically distributed computer networks & network operating systems. Provide user support, network troubleshooting, network expansion, printer services & backup mgmt. Coordinate local & remote hardware & software configuration; implement & maintain operations procedures & monitor system resource utilization; perform capacity planning. Interface main application environ. w/underlying networking software. Carry out performance tuning of network for user applications. Req: B.S. in sci./ comp. sci./engrng or equiv. 2 yrs exp in job offered or as programmer analyst/systems analyst. Must have appropriate combination of skills as follows: 2 of A & 2 of B & 1 of D; or 2 of A & 3 of B & 1 of C & 1 of D. A. Includes Operating Systems: Novell NetWare, Windows NT, OS/2, Windows 95, LAN Server, Banyan Vines, LANtenger, LANtastic; B Includes networking: IPX/SPX, TCP/IP, PTP, Windows for Workgroups, NetBIOS, X.25; C Includes Network mgmt: SNMP, LANanalyzer, NetView, NetManager; D Includes LAN technologies: Ethernet, Token Ring, FDDI, High mobility required. (Multiple positions) 40 hrs/wk; $48,500 - 65,000/yr. Reply/submit resume to PA Job Ctr at its James Hamstra, Dept., Office of Employment Sec., 120 Marshall St., Pittsburgh, PA 15608. JO #1087916.

PROGRAMMER/ANALYST: (5 positions) 40 hrs/wk. 8 a.m. - 5 p.m., $40,500/yr. Carry out the program analysis, program design, coding and testing of software application systems on IBM compatible computers utilizing MS-Access, Windows and EXCEL. Reqr bachelor's degree in Computer Science or Electrical or Mechanical Engineering. Reqs. 6 mos exprr in job offered or 6 mos. exprr in Systems Analysis &/or Programming &/or Computer Consulting &/or Assistant. Reqr. work exprr with IBM compatible computers, MS-Access, Windows and EXCEL. Employer is a/e/e development/consulting firm. Relocation to client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 418, Detroit, MI 48202 Ref. No: 128998.

SYSTEMS ANALYST (Denver, Colorado area) to analyze, design, develop, implement and maintain database systems using object-oriented and client/server technologies. Prototype and implement graphic user interface; train users. Utilize OS/2, C++, DB2 and SNA Software. Requirements: Bachelors Degree in Computer Science or Electrical Engineering. Two years experience as LAN Administrator or Software Engineer. Such experience must include two years of experience using OS/2, C++, DB2 and SNA Software. Salary: $48,000/yr. Hours: 40 (8:00a.m. - 5:00p.m., M-F) If interested please mail resumes to: Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117, and refer to order number CO4497936.

PROGRAMMER/ANALYST (2 positions) 40 hrs/wk. 8 a.m. - 5 p.m., $43,500/yr. Carry out the program analysis, program design, coding and testing of software application systems on IBM mainframe environment utilizing MVS, COBOL, CICS and DB2. Assist in technical documentation. Reqr. bachelor's degree in Computer Science or Electrical or Mechanical Engineering. Reqr 2 yrs. exprr. in job offered or 2 yrs. exprr. in Systems Analysis &/or Programming &/or Computer Consulting. Reqr. work exprr. in dev. of a/e/e systems on IBM mf and with MVS, COBOL, CICS and DB2. Employer is a a/e/e development/consulting firm. Relocation to client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 418, Detroit, MI 48202 Ref No: 128998.

SOFTWARE ENGINEER: M.S. in Computer Engineering (employer will consider M.S. in any field of engineering or physics each with 18 hrs. of course work in Computer Science, also qualify for the educational requirement). Designs, develops & implements software system in conjunction with hardware development for cardiological systems application. Must be knowledgeable in Computer Graphics, Advanced Microprocessor Systems, & Digital Signal Processing (3 hrs. course work, or comparable course work, or 1 yr. experience in each area). $41,600.00/yr. 40 hrs./wk. Must have employment authorization in the U.S. Apply at the Texas Workforce Commission, Houston, Texas or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas 78701 JO #TX7856373. Ad Paid by An Equal Opportunity Employer

---

TANDEM
COBOL, PATHWAY, TAL, SCOBOL, C, SQL, X.25

STRATUS
PL/I, COBOL, C, ON/2

MUMPS - UNIX
SUN, HP, RS/6000, GUI, SDK, Powerbuilder, C++, Visual Basic, Full-time/Consulting Positions available in the US/ABROAD

STRATUS

800-682-JOBS
TEL: (516) 677-8900
FAX: (516) 677-1220
EMAIL: tass@erastem.com
7800 Jericho Tpke
Woodbury, NY 11797

The Recruiting Advantage, Inc.

SAP

We specialize in:
The placement of SAP professionals - all modules, ABAP, BASIS.
Contract & Permanent Positions Available Nationwide.
We have low overhead so we can pay you top rates.

People Unlimited
1911 South Blvd. Ste. 210
Charlotte, NC 28270
Phone: 704-841-1136
Fax: 704-845-1082

Software engineer with two years of experience as a software engineer or computer professional, who will develop a/e/e systems, applying computer science, engineering, and mathematical analysis, with two years of experience using Oracle Forms, Oracle Reports, Oracle RDBMS and PL/SQL. Analyzes software requirements and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: engineering, mathematics, physics or computer science. $60,000/yr. 40 hours/wk. 9:00 - 5:00. Send resumes, listing job order number 8007778, to Vince Messevich, OES, 346 Fifth Ave., McKeesport, PA 15132.

Programmer/Analyst - various client sites (most of time in Moline, IL) but in Bloomington MN, Chicago, IL & Omaha, NE Analyze users' needs, evaluate systems & s/ware; enhance & modify modules to systems, implement, test & debug. Utilize UNIX, DCE & C. Bach./Comp. Sci. Engg or Math /phys+exp. in job offered. Must be willing to travel & relocate as needed (reimb. by empl.) Exp. must incl. 1yr using UNIX, DCE & C. 40hrs/wk (8-5, M-F) $48,000/yr. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both resume & cover letter to: Illinois Dept. of Employment Security, 401 South State St. - 3 South, Chicago, IL 60605. Attn: Brenda Kelly, Ref. # V-IL 15608-K. An Employer paid ad. No Calls.

Software engineer with one year of experience as a computer professional who will develop a/e/e systems, applying computer science, engineering, and mathematical analysis, with one year of experience in design and development of software systems for Win32 SDK platform under Windows NT using Graphic User Interfaces, Visual C++, and case libraries, including MFC. Analyzes software requirements and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in a computer science field. $48,000/yr. 40 hours/wk., 8:00 - 5:00. Send resumes, listing job order number 2007836, to Duane Brentzel, O.E.S., 569 Belle Lane, Greensburg, PA 15601.

KCS

KCS Computer Services is a premiere system integration, training, and custom software development organization. KCS is seeking Systems and Data Architects, Analysts, Programmers, and Communications Experts in Mainframe and Client/Server environments. In addition, KCS seeks industry experts in Banking, Healthcare, Manufacturing, and technical experts in Multimedia and MicroSoft. The following are typical skills required:

- UNIX/DB2/NT/NOVELL
- ORACLE/INFORMIX/ INGRES/SYBASE/SAP
- VISUAL BASIC/VISUAL C++ POWERBUILDER/C++
- C/MICROFOCUS COBOL
- COBOL/CICS/NATURAL
- IMS/DB2

KCS also has an additional office in Cleveland.

KCS Computer Services, Inc., 777 Penn Center Blvd., Suite 600, Attn: CW16, Pittsburgh, PA 15238-2906

Phone (412) 823-8622
Fax (412) 823-8621
http://www.kcscorp.com/

Search Computerworld's Archives

www.computerworld.com

COMPUTERWORLD

Start your day...

@COMPUTERWORLD

The Internet Connection for the IT Community

www.computerworld.com

To hear the @COMPUTERWORLD Minute from a telephone, call us at (800) 340-2262.

CONTRACTORS

www.winterwyman.com

INFORMATION SYSTEMS
- Oracle Developers & DBA's
- MS-Access, Visual Basic
- Messaging, cc:Mail, Notes Organizer (Win 3.x, Win95 and NT)
- Netware Administrator
- SAS, VAX/VMS, MVS (Pharmaceutical exp.)
- Lotus Notes Administrator (R3 R4)
- Mainframe/COBOL, DB2, CICS
- Validation, Verification QA
- UNIX Systems Administrator (Sun, Solaris)
- Delphi Developers
- Visual C++, NT, OLE

SOFTWARE ENGINEERING
- Internet Multimedia Product Developer Visual C++, NT, OLE, MFC
- Live Internet 3-Tier Development: RDBMS, UNIX-Middleware, GUI
- C/C++, Motif, Unix
- Visual C++ on NT (Database Engine)
- Macintosh, Code Warrior
- JAVA and JAVAScript on NT
- Visual Basic, Active X
- QA: SQA Robot, MS-Test (SQL, 4GL, RDBMS)
- Internationalization (double-byte enabling)
- Novell Network Drivers

Winter, Wyman Contract Services

BOSTON AND NATIONAL CONTRACTS:
Contact: Donna Byrne 617-890-7007
800-890-7002 (Outside MA) Fax: 617-890-4433
Email: contract@winterwyman-contract.com
204 Second Avenue, Waltham, MA 02154

ATLANTA
Contact: Todd Graham Email: atlanta@winterwyman.com
770-933-1525 Fax: 770-933-1526
1100 Circle 75 Pkwy, Ste. 800 Dept. CW, Atlanta, GA 30339

Reengineering Consultants
Windows Developers
Manager - Development

Teris A division of StorageTek

Teris Consulting Group, a division of StorageTek, is recruiting national "top flight" consultants and Windows developers/integrators to join our winning team. Candidates must have an appropriate degree and/or significant consulting or systems integration experience in our target industries (pharmaceutical, petroleum, power/utility, telecommunications, and banking). Most positions require extensive travel.

Reengineering Consultants **- Experienced consultants with a background advising clients in business reengineering, strategic issues, process redesign techniques, organizational innovation, and workflow solutions within target industries. MBA or equivalent.**

Windows Developers/Integrators **- Development experience with C, Visual Basic, PowerBuilder, Windows, APIs, DLL, DDE, and Oracle or SQL Server. Knowledge of workflow management software and imaging technology is desired.**

Manager - Development **- Experience in managing Windows developers and workflow systems.**

StorageTek, a $1.9 billion corporation, is an EEO employer offering competitive salary/benefits packages and employee growth. Please send or fax your resume with a letter indicating the position to: Teris Consulting Group, 1901 S. Harbor City Blvd., Suite 600, Melbourne, FL 32901. Fax: 407-952-0674

Systems Administrator to provide systems support to a large WAN network of heterogenous TCP/IP LANs. The machines to be supported are HP 7xx/8xx, IBM RS 6000, Sun, SGI UNIX workstations, high and UNIX filesystems and a wide range of PCs. Responsibilities include: maintaining the fileservers using Logical Volume Manager (LVM) and large disk arrays, design and implement disaster recovery policies and set up automated backups using NetBackup/Legato, set up Domain Name Service (DNS) and NIS, maintaining the maps and administering NFS and PCNFS for the domain, install new workstations, kernel redesigns, shell scripting using C shell, Korn Shell and POSIX shells, network support for PCs using PC LAN products such as Novells Lan WorkPlace/FTP's TCP/IP and to install troubleshoot, maintain automotive CAD/CAM/CAE software (Ideas/Unigraphic/Catia/PDGS). Require M.S. in Electrical and Comp. Eng. and 1 yr exp in the job offered or as a System Admin./Software Assoc. which includes maintaining high-end UNIX operating systems, planning and implementing high-end automated backups using Legato and NetBackup, designing and maintaining network services such as DNS, NIS and NFS, and installation and troubleshooting of TCP/IP based communications software. 40 hr wk. 9am-5pm, $48-62K/yr. Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202. Ref No. 120596. Employer Paid Ad.

Software Engineer - SAP Specialist: Structured systems analysis, process engin'g, design, configuration, prototyping, developm't, testing, QA, implementation, integration, maintenance & knowledge transfer of SAP R/3 & SAP R/3 systems for business, fin'l, banking, mfg & other commercial application systems in a multi-hardware environ. using centralized or distributed Relational Database Mgmt Systems (RDBMS), Fourth Generation Languages (4GLs) & other GUI (Graphical User Interface) front-end tools. Req: B.S. in comp. sci., sci. or engin'g (or equiv.) & 2 yrs exp in job offered or as programmer analyst/systems analyst. Must have appropriate combination of skills as follows: 1 of A, A of B, or 3 of A & 1 of B; or 2 of A; or 2 of B. A includes PI, CO, AM, SD, MM, PP, QM, PM, HR, FI, WF, IS, BW; B includes ABAP/4, Screen Painter, Menu Painter, SAP Script, Comm. Transport, Data Dictionary, Function Modules, User-Exit Routines, SAP Installation. High mobility preferred. (Multiple positions) 40 hrs/wk; $48,000 - $80,000/yr. Report/submit resume to PA Job Ctr of Mr. Steve Fore, Actg. Mgr., Office of Employment Security, 3 Kensington Square, New Kensington, PA 15068. JO #6015049.

Software Engineer (Unisys) - Multiple Openings

Analysis, design, development, implementation and maintenance of on-line and batch oriented business applications in a multi-software multi-hardware environment including Unisys 1100/2200, A-series or V-series mainframes using database systems, third and fourth generation languages, data management software utilities and tools. B.S. in Computer Science/Engineering/Science (or equivalent) and 2 yrs experience in job offered or as Programmer Analyst/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A, 1 of B and 1 of C; or 1 of A and 2 of B; or 2 of A and 1 of B. A includes DMSII; DMS 1100, RDMS 1100, DMS II; B includes Tools/ Languages: DPS 1100, TIP, UNC II, COBOL/ QES/COB, ALGOL, LINC MAPPER, COBOL; and C includes software USAS. High mobility preferred. 40 hrs/week, 8 AM - 5 PM. $48,000 - $60,000 per year. Qualified applicants should contact or send resume to Mr. Richard Iatesanzo, Manager, Office of Employment Security, 1122 Western Avenue, Pittsburgh, PA 15233. Refer to Job Order # 6015819.

IFS Where the Future Is Happening Now!

At IFS Industrial and Financial Systems we have successfully learned from our customers, promoted their ideas - and ours - and have grown rapidly to become a major business solution leader supplying quality software to a global market. As we expand into the North American marketplace with over 10 years under our belt, we are now growing by more than 40% per year, and are fiercely proud of the more than 500 IFS employees worldwide who put their business and project competence at the disposal of our clients every day. We work closely and proactively with our clients to help them develop their business. Enthusiastic and entrepreneurial - we work as a team to do our best for our hundreds of customers as well as for each other.

As a top international supplier of ERP-based client/server solutions for the modern enterprise, we know that making an idea work is difficult, and our customers know that regardless of the industry, market niche, or manufacturing methods involved, we can help implement new ideas quickly.

Our industry specific business solutions and competencies can be found in virtually every field, especially in rail and transit, medical products, FDA regulated, pulp and paper, and telecommunications companies where our solutions support a life cycle view of manufacturing and service maintenance management. The list of our client companies grows every day representing a strong, loyal group of customers who are the driving force behind our continued development and focused globalization. Now, with our rapid growth and recent expansion into the United States, we are seeking motivated people to join our expanding team.

Learn more about IFS and explore these employment opportunities:

Sales Account Managers
San Francisco Bay Area and Minneapolis
- Knowledge of medical products, FDA regulated, telecomm, pulp and paper or discrete manufacturing industries is desirable.

Pre-Sales Consultants
San Francisco Bay Area, Pittsburgh, Minneapolis, Chicago, NY/NJ, Raleigh
- Rail and transit, medical devices, FDA regulated, pulp and paper, telecomm or discrete manufacturing preferred.

Partner Support Manager
Raleigh, Tucson, or Chicago
- Develop and manage the indirect sales channel along with partner implementation activities. Successful experience required.

Business Analysts
Raleigh, Tucson
- Medical devices, FDA regulated, rail and transit, or telecomm exposure a plus.

Software Developers
Tucson, Raleigh
- Oracle v.7, PL/SQL, Centura/SQL Windows, Powerbuilder, or Oracle Forms 4.5, GUI applications or object oriented design or development experience preferred.

Systems Engineers
Tucson, Raleigh
- Oracle v.7, PL/SQL, UNIX, Oracle DBA, and performance tuning experience required.

Get in touch with us right away. We have job opportunities immediately available in many locations! Please, contact our Human Resources Department, indicating your specific job interest through (opportunities@ifsna.com), 3716 E. Columbia St., Tucson, AZ 85714, or via fax at 520-512-2530. You can also visit our corporate website at (www.ifsab.se.com) or reach our Marketing Department at 1-800-282-5661.

We look forward to getting to know you at IFS - Where the Future Is Happening Now!

85 offices in Chicago, Dallas, Minneapolis, Newark, Pittsburgh, Raleigh, Tucson

---

Computer Jobs.
Lots of 'em
http www
Select
.com
954 424 0563

Fax & relocation paid. Mail or fax resume to Louise Hampton at:
DUNHILL STAFFING SOLUTIONS
P.O. Box 700868
San Antonio, TX 78270
Phone: 210-490-1744
Fax: 210-490-2355

Simply the BEST

OREGON BEST

Enjoy the Pacific Northwest lifestyle with the best of the BEST. Projects range from new development for mainframe developers to designing solutions for complex systems integration challenges. Excellent partnering relationships with client base. Generous salaries, cafeteria-style benefits, constant training opportunities. To learn how you can benefit from our growth needs, contact or send resume to:

BEST Consulting
7900 S.E. Hatheway, Suite 1400
Portland, OR 97222
(503) 236-5774 (503) 236-5784 FAX
hrmpdx@bestnet.com

- Visual Basic • Progress
- Visual C++ / MFC
- Windows 95 • NT
- Cobol • Oracle • PB/SYB

1-800-224-1286

Software Engineer (Oracle Specialist: Structured systems analysis, design, develpm't, testing, quality assurance, implementation, integration, maintenance & support of large volume online complex integrated client-server based business, fin'l, banking, mfr'g & other commercial application systems in a multi-hdwr/multi-s'ware environ. using centralized or distributed database systems using Oracle Relational Database Mgmnt System (RDBMS) & related software. Design of large application systems & databases in a Co-operative Development Environ. (CDE); & analysis, design & development of applications using CASE (Computer Aided Software Engin'g) tools. Req: B.S. in comp. sci., sci. or engin'g (or equiv.) & 2 yrs exp to job offered or as programmer analyst/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B; or 2 of A & 2 of B. A includes Oracle RDBMS, Oracle CASE tools (Designer, Dictionary, Generator), CDE 2, Oracle Financials; B includes PRO*C, SQL*Forms, SQL*Reportwriter, SQL*Plus, SQL*Menu, PL/SQL. High mobility preferred. (Multiple positions) 40 hrs/wk; $49,000 - $60,000/yr. Roger Voutsinas resume to PA Job Ctr at Ms. Jean Lang, Rep., Office of Employment Security, 320 Biltmar Drive, Pittsburgh, PA 15205. JO #2007931

PROGRAMMER/ANALYST to analyze, design, develop applications using client server architecture, install and maintain systems including database performance analysis, tuning, documentation of the system, troubleshooting and database administration. Utilize Sybase, SQL Server PowerBuilder and Erwin Case Tools. Requirements: Bachelors degree in Computer Science, Mathematics or Engineering. Two years experience as a Systems Analyst and/or Diagnostic Engineer. Experience must include one year using Sybase, UNIX, PowerBuilder and Erwin Case Tools. Salary: $82,000/yr. 40 hrs./wk. (8a.m. - 5p.m., M-F) Please send resumes to Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117. Order number CO4496819

ENGINEER II required. Design & development of multi-platform, object oriented distributed communication & software systems for AIN (Advanced Intelligent Network) applications using C/C++, UNIX IPC, the UNIX System & operating system & knowledge of bridging between telecommunications & computer networks. Support private-line services, switch services & other specialized/enhanced telecommunications. Support includes requirement analysis, configuration analysis, performance evaluation & competitive analysis as well as troubleshooting & systems integration. Master's degree or its equivalent required in a Computer Intensive Curriculum plus 1 year experience in the job duties described above. Will accept a Bachelor's degree with 2 or more years experience in lieu of the formal Master's. Must have proof of legal authority to work in the U.S. Salary - $31 000/year for a 40 hour work week. Interested applicants send resume to the Oklahoma State Employment Service, 110 S. Hartford, Suite 106, Tulsa, Oklahoma 74120 (ID#7207). Phone No. (918) 592-2111. Refer to Job Order #246508. Ad paid by an Equal Opportunity Employer

Programmer Analyst, 40 hrs/wk, 8am-5pm. $42 000/yr. Analyse, design & programming of business applications for large-scale systems. Integration projects. Implementation of client/server technology using object-oriented technology. Computer networks & telecommunications including OSI 7 layer architecture & TCP/IP. Tools: UNIX, Windows NT, MS-DOS, C/C++, SQL, RDBMS, MS-Excel, MS-Access, MS-Word. B.S. in Computer Science as well as 3 mos. exp. in job offered or as Application Developer required. Previous exp. must include client/server technology, SQL, program design, MS-Excel, MS-Access, computer networks & telecommunications including OSI 7 layer architecture & TCP/IP. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605, Attention: Janet Aschenbrenner. Reference #V-IL-15678-A. NO CALLS. An Employer Paid Ad

Software Engineer - Legacy Systems AS/400, IBM 3090 - three openings. Systems analysis, design development, testing, quality assurance, implementation & support of on-line based accounting, inventory, manufacturing, finance & other business applications using ' relational database management systems (RDBMS), Fourth generation languages & other software utilities in a multi-hardware/multi-software environment including IBM mainframes, mid-range & PC systems. M.S. in Science/Computer Science/Engineering (or equivalent) as well as 2 yrs exp in job offered or as Programmer Analyst/Systems Analyst required. Prior exp must include COBOL/400, VSAM, CL/400, IBM Networking, CICS, DB2, VS-COBOL II. Must be willing to relocate. 40 hrs/wk, 8am-5pm, $50 000/yr. Send resume w/ social security no. to: Sean Blancaneaux, Indiana Dept. of Workforce Development, 10 N. Senate Avenue, Indianapolis, IN 46204-2277. ID# 3450311

ANALYST PROGRAMMER required. Design, develop, implement & test Object Oriented applications for intelligent systems/ Neural Networks using C/C++, UNIX Shell scripts, Lex & Yacc & Oracle RDBMS. Develop GUIs using Visual BASIC, Power Builder & TCL/TK on Windows & OS/2 platforms & X/Motif on UNIX. Bachelor's degree or its equivalent required in any Computer Intensive Curriculum such as Math, Computers, or Engineering plus 1 year experience in the job duties described above. Must be willing to relocate to various unanticipated work sites throughout USA every 4-10 months. Employer Paid. Must have proof of legal authority to work in the U.S. Salary - $35,000/year for a 40 hour work week. Interested applicants send resume to the Oklahoma State Employment Service, 11654A E. 21st St. Tulsa, Oklahoma 74129 (ID#7209). Phone No. (918) 437-0844. Refer to Job Order #240830. Ad paid by an Equal Opportunity Employer

SOFTWARE ENGINEER (2 positions) 40 hrs/wk, 8 a.m. - 5 p.m., $52,000/yr. Carry out the systems analysis, systems design, coding and testing of computer software application systems utilizing COBOL, PL/I, TSO and IMS. Requ. bachelor's degree in Computer Science or Electrical or Mechanical Engineering. Requ. 4 yrs. exper. in job offered or 4 yrs. exper. in Systems Analyses &/or Programming &/or Engineering &/or Computer Consulting. Requ. work exper. in dev. of s/w systems with COBOL, PL/I, TSO and IMS. Employer is a s/w development/consulting firm. Relocation to client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 121396.

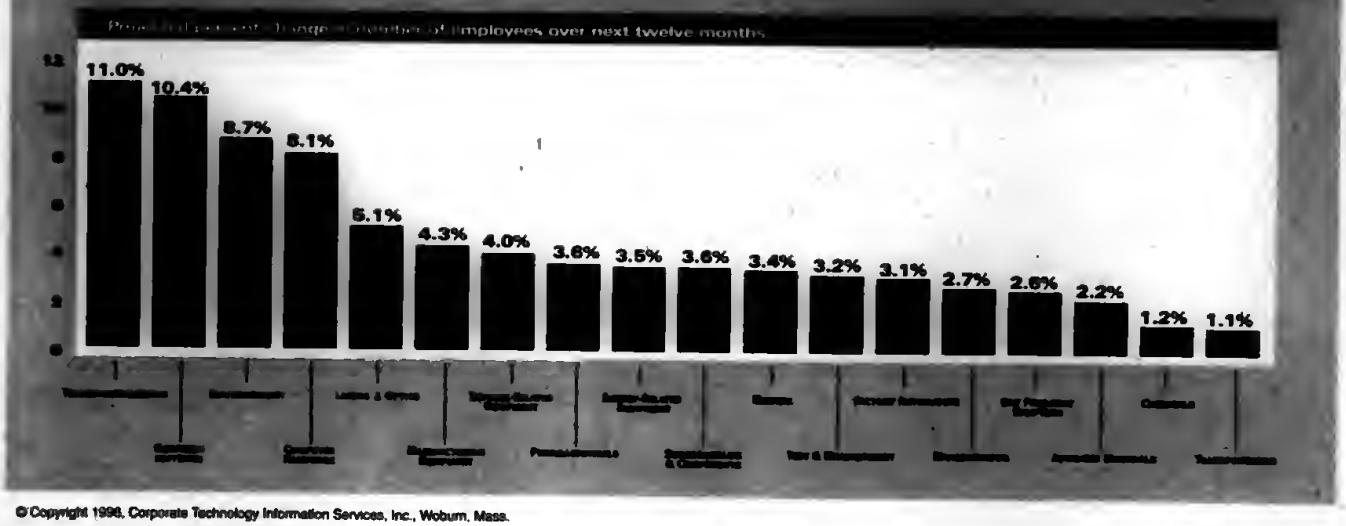
Software engineer with three years of experience as a s/w engineer or computer professional who will develop s/w systems, applying computer science engineering, and mathematical analyses, with three years of experience using Oracle and at least one year of experience using Oracle Financials including Accounts Payable and Accounts Receivable modules, tools including Forms and Reportwriter and programming in Visual Basic. Analyzes software requirements and performs testing and user training after development. Extensive travel and frequent relocation. Master's degree in one of several limited fields including mathematics, engineering or a computer science field. $72,000/yr. 40 hours/wk., 9:00 - 5:00. Send resumes, listing job order number 9061868, to: Charlene Copley, 2103 Ninth Ave., Beaver Falls, PA 15010

Software Engineer - client sites & Co. loc. in Tampa, FL. Research, design & develop s/ware systems in a client server environ. Analyze s/ware reqs. consult w/technical staff in each phase of development: direct s/ware testing, programming & documentation. Utilize Motif, Informix, UIMX, Object Oriented Paradigm & OSF (middleware). Bachs/Comp. Sci. Engg. or Math + 1yr/exp. in job offered or 1yr as Prog/Anal. Exp. in job offered or related occ. must incl. 1yr. using Motif, Informix, UIMX, Object Oriented Paradigm & OSF (middleware). 40hrs/wk (8-5 M-F) $35,325/yr. Send resume to: Job Service of Florida, 2312 Gulf-To-Bay Blvd., P.O. Box C, Clearwater, FL 34618-4090. Re: Job order number FL-1502119

http://careers.computerworld.com

http://careers.computerworld.com

Corptech Career Index



© Copyright 1996, Corporate Technology Information Services, Inc., Woburn, Mass.

VICE PRESIDENT SOFTWARE PRODUCT DEVELOPMENT

Our client is the leading provider of demographic, and decision support systems to the market research, direct marketing and targeted marketing industries. This international company is offering the right individual a unique opportunity to make a major contribution at the forefront of technology. They are seeking an experienced individual to design, build, and launch their next generation of marketing decision support software and data delivery products on Windows 95 and NT. These systems involve the use of the most up-to-date technologies around: Object Databases, OOA/OOD, the Internet, 32 bit programming, Geographic Information Systems, ODBC, OLE/COM, SQL, Oracle MS Visual C++, HTML, ActiveX, etc.

With offices conveniently located in Northern Virginia, you will be able to walk to Georgetown for lunch, or run along the Potomac River if that's more your style.

To qualify, candidates must have:

- A proven record of 10+ years experience bringing software products to market, with a particular emphasis on DSS client/server systems in MS Windows (16 and 32 bit)
- 5+ years management experience, with management of remote resources a plus.
- Technical expertise in C++, OOA/OOD/OOP, MS Windows, data warehouse, client/server, OLE, application layer DSS issues, and the Internet
- Familiarity with VB, Geographical Information System and ODBMS a definite plus.

For confidential consideration, please send resume to:

Bill Young
The Shamrock Group
8381 Old Courthouse Rd., Suite 300, Vienna, VA 22182
Phone: 703/394-6818 • FAX: 703/573-3612
E-mail: bill.young@shamrockorg.com
AN EQUAL OPPORTUNITY EMPLOYER

Computer Consultant (Chicago) Analyze business procedures & problems of a wide variety of business & organizational clients. Design, develop, test & implement systems to address client's needs utilizing the following computer methodologies: IBM ES/9000 & 3090 mainframe w/ MVS/ESA operating system & V5 Cobol II language w/ JCL, DB/2 Oracle database, Spufi, QMF, SQL*Forms, SQL*Plus, PL/SQL database tools; Visasit, Intertest & Expediter debugging tools, CICS user interface programming & OLTP. IBM AS/400 products such as: SQL/400, RPG-400, Cobol/400 & Visual Basic on a client/server system. Study client's existing data handling systems to evaluate effectiveness & develop new systems to improve production as required. Specify in detail logical and/or mathematical operations to be performed & plan & prepare technical reports, memorandums & instructional material relative to the establishment & functioning of operational systems software. 40 hrs/wk, 8:30 am-5pm, $42,000/yr. Must have a Bachelor's in Computer Engineering & 2 yrs exp in job offered or 2 yrs exp as a Programmer/Analyst. Must have completed at least one project involving the design, development, testing & implementation using each of the following: 1) IBM ES/9000 or 3090 w/ Oracle, SQL*Plus, SQL* Forms & PL/SQL, and 2) IBM ES/9000 or 3090 w/ DB/2, CICS, QMF, Spufi & JCL, 3) CICS programming that interfaces w/ client/server architecture on a LAN through a DCL system. Also must have project exp w/ each of the following: Visual Basic on a client/server system, IBM AS/400, Intertest, Visasoft or Xpediter, VS-COBOL II & MF-Revolve for documentation & analyses of mainframe programs. Must have proof of legal authority to work permanently in the US. Send resume/ltr in dupl to Illinois Dept of Employment Security, 401 South State St - 3 South, Chicago, IL 60605. Attn: Brenda Kelly, Field V-II, 15749-K. An employer paid Ad. No calls.

Software 2000

Software 2000 is adding Windows NT development to our list of successes. Already an industry leader on the AS/400 platform, we are taking our corporate commitment to quality, technology and growth to Windows NT. We are creating an exciting, challenging environment of the most current technologies: NT, OLE, C++, MFC, Active-X...and looking for the most talented people to help us get there. Since 1981, Software 2000 has helped companies worldwide solve their financial, materials management and human resource management related business issues with the use of our software, and the help of our support teams. We are growing! During 1996, Software 2000 has reported 91% growth in third quarter earnings, with a 128% increase in international revenue for the same period.

Better. Smarter. Faster.

The Power is in Your Hands

Opportunities exist in Waltham, MA

Director, Windows NT Development

Have you managed large teams in a software applications product-driven environment (i.e. D&B, Marcam, Lawson, Peoplesoft)? Have you overseen several successful releases of products built in a new NT development environment? The qualified candidate will also have at least 10 years software development, and 5 years management experience. MS/BS in CS or related degree required.

Manager, Windows NT QA

Are you a strong QA Manager with large scale applications systems experience in a product-driven environment? Do you have strong technical abilities in an automated testing, NT environment? The qualified candidate will also have at least 7 years experience in software product testing with at least 2 years of project management experience. MS/BS in CS or related degree required.

Manager, Windows NT Documentation

Are you a strong Documentation Manager who has experience in overseeing teams in the utilization of the newest, automated technologies? The qualified candidate will also have at least 7 years experience in software product documentation and 2 years project management experience. MS/BS in CS or related degree required.

Software Engineers

Software Engineers with NT, MFC, C++, and OLE, on either the applications or systems side. At least 3 years commercial development experience and MS/BS in CS or related degree required.

Software 2000, Inc. offers a competitive salary and quality benefits package. Our benefits package includes ESPP and tuition reimbursement. For confidential consideration, please contact Torie Iler, Technical Recruiter at (617) 684-4575, fax (617) 684-4597, email torie_iler@s2k.com or mail your resume to Software 2000, Inc., 1000 Winter Street, Suite 4200, Waltham, MA 02154. **For more information about Software 2000, please visit our home page at http://www.s2k.com.** We are an Equal Opportunity Employer.

Pacific Northwest

PDG
Pacific Data Group

PDG's aggressive positioning has opened up a large market of client/server opportunities. PDG's strong presence in the mainframe market continues to thrive with new clients driving our growth.

Our 9 years of double digit growth & market leadership is due to our strong ethics, skilled employees & ability to offer top pay. PDG offers an attractive compensation & benefits package. For immediate consideration, mail, fax or e-mail your resume to:

Pacific Data Group, Inc.,
10260 SW Greenburg Road, Suite 220,
Dept C, Portland, OR 97223
Fax: (503) 293-3896. Tel: (503) 293-3499
Internet: recruiter@pacificdata.com
Web: http://www.teleport.com/~pdg
Equal Opportunity Employer

- Oracle Version 7
- Designer/2000
- Developer/2000
- Oracle Applications
- Oracle WebServer
- Visual Basic
- Access
- C/C++
- Delphi
- SQL Server

Business Alliance Programmer

Microsoft SOLUTION PROVIDER

- DB2, CSP
- CICS, COBOL
- IMS DB/DC
- IDMS/DC
- IEF

Dun & Bradstreet "E" "M" & SmartStream Opportunities

DH-DATA CORPORATION is currently recruiting qualified D&B professionals for nationwide consulting and perm opportunities. Consulting to $90.00 per hr +per diem. Perm to 90K + rels. Positions available immediately.

- **Dun & Bradstreet's M & E Series (M&D or MSA), Mainframe and Client Server, SmartStream/StreamBuilder.** Financials, FR, HR, FA, GL, AR, AP, etc.
- **Sybase**
- **PowerBuilder**
- **UNIX, C**
- **COBOL II, COBOL 370**
- **Oracle**
- **Peoplesoft**

Join the winning team by contacting:

DATABASE EXPERTS

Relocating to Costa Rica challenge? We have outstanding positions for:
DBAs & DB Analysts.
All DBA / Data & Focus Paid

Sr. DB Expert to $85k
7 years comp. sales exp. with multiple RDBMS's for comp. Database expert on planning & integration

Data Warehousing to $75k + stock
Oracle/Unix Project Mgr with strong technical & business skills

Oracle DBA to $70k
Oracle & Unix or Windows for development of large systems

Also:
Developer Internals & C++ to $70k
Client/Server & Unix to $60k
Oracle Manufacturing to $65k
GUI/Powerbuilder to $65k
Informix DBA to $60k

HAMILTON
TECHNICAL RESOURCES, INC.
P.O. Box 303 West Nyack, NY 10994
914-679-4050 Fax: 914-679-5704
http@mhv.net
http://www1.mhv.net/~http/

OPPORTUNITIES IN SAUDI ARABIA

The business of BDM International is providing innovative IT services, systems, and solutions to clients worldwide. Our two-year assignments in Riyadh, Saudi Arabia, are accompanied tours that provide an excellent international compensation package, including housing, transportation, dependent schooling, and liberal benefits. We are looking for the following professionals with at least eight years' DP experience:

IBM Storage Manager
Plan, install, and maintain SMS on IBM mainframe.

IBM Communications Specialist
Support and maintain NCP and VTAM, as well as interface to PC gateways on an IBM mainframe.

Oracle DBA
Install, support, and maintain Oracle 7.0 RDBMs.

Network Administrator
Install, support, and maintain Microsoft NT. CE certification required.

Systems Analyst
Analysis and design of PowerBuilder applications.

Programmer/Analyst
Experience designing and programming current Web tools.

Senior Systems Programmer
Support and maintain latest release of MVS and associated programs on IBM mainframe.

DB2 DBA
Support and maintain IBM DB2 on IBM mainframe.

If you are seeking a rewarding challenge and meet our selection criteria, please send your chronological resume to: BDM International, Inc., ATTN: Saudi Support Office (Dept. CW10), 1501 BDM Way, McLean, VA 22102; FAX: (703) 848-6198, e-mail: Grichard@bdm.com. U.S. citizenship required. EEO

BDM®

For an extraordinary climate for career advancement.

ALLTEL *is there.*

ALLTEL is America's largest provider of automation software for the mortgage industry and growing at a phenomenal pace...which means it's a great place where talent and advancement are greatly encouraged. And a place where innovation, unparalleled quality and excellence are absolute givens. The following positions are available at our Jacksonville, FL location.

Capacity and Performance Specialists

The selected candidates will be part of a team that manages the performance management and capacity planning for the mainframe hardware, system software, and application software. Strong proficiency with SAS, MXG, STROBE, RMF/SMF and Candle products is a plus.

ALLTEL is a fast-paced, state-of-the-art datacenter with a rich heritage in traditional legacy applications. We are rapidly developing and deploying open-system applications as a compliment to our legacy environment. If you are an expert in your field, we would like to hear from you. Please send resume and salary history to **Waine Cardinal, Response Code 06, ALLTEL Information Services, Inc., Mortgage Division, 601 Riverside Avenue, Jacksonville, FL 32204-2987, FAX: 904-634-4282.** No phone calls please. EOE M/F/V/H

ALLTEL INFORMATION SERVICES, INC.
Mortgage Division

Start your day...

@

COMPUTERWORLD
The Internet Connection for the IT Community

www.computerworld.com

ATTEND

Bay Area CORPORATE TECHNICAL RECRUITING CONFERENCE

COMPUTERWORLD

Computerworld's Bay Area Corporate Technical Recruiting Conference!

Monday, November 4, 1996
Hotel Nikko, San Francisco, California

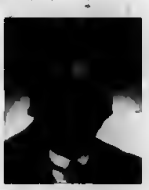
On November 4, 1996, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the first-ever San Francisco area Corporate Technical Recruiting Conference, held at the Hotel Nikko, San Francisco, California.

A Full Schedule of Contemporary Topics

7:30am	**Continental Breakfast & Conference Registration**
	Concurrent Sessions:
	Candidate Selection: How to Pick the Right People Dr. William Swan, President, Swan Consulting
	The Critical Importance of Soft Skills and the "Invisible Assembly Line" Todd Schmick, Priority Management Systems, Inc.
	Immigration Issues David P. Berry, Esquire, Berry & Appleman
	Proactive Recruitment Techniques Dave Drugman, President, Bay Cities Research, Inc.
12:15pm	**Luncheon Keynote: Industry Trends**
	Repeat of Concurrent Sessions
	Town Hall Forum John Younger, President, y-net
6:00p.m	**Program ends**

Selected sessions include:

Proactive Recruitment Techniques



Dave Drugman,
President, Bay Cities Research, Inc.

To remain competitive, today's technical recruiters need to be aware of the latest trends in sourcing and proactive recruiting. This in-depth session from a leading expert will explore this critical topic and will help you put your resources and expectations into proper perspective.

Town Hall Forum

John Younger, President, y-net

In this session, you'll not only be able to propose your specific questions for open discussion, you'll learn of real world issues and solutions from your peers. You won't want to miss this rare opportunity as John Younger, an expert in the HR field, leads us through this modern discussion of your recruiting topics.

For more information, call the conference hotline:
1-800-488-9204

This Web site

e-mails
you with the
career opportunities
you want.

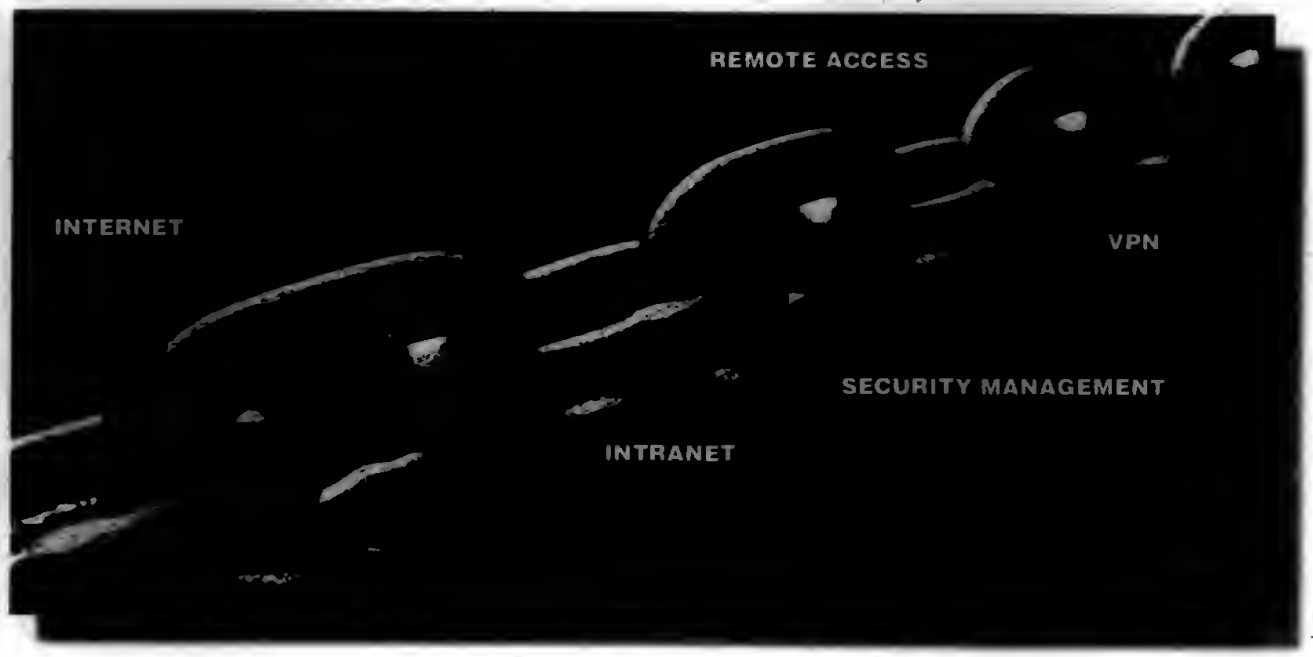
Register today and
use CAREERMAIL

http://careers.computerworld.com

itCareers.

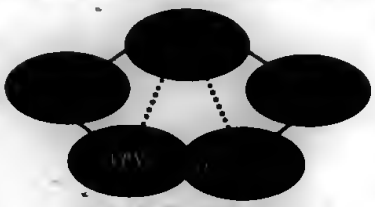
Where the careers find you.

No missing links with Cylink Total Network Security solutions.



Total Network Security is more than a firewall. And when you manage an enterprise with several types of networks, the security system you have for one may be insufficient for another. You need a security solution that is designed to manage every type of network.

Cylink understands your business and security needs. Since 1984, we've enabled the largest banks, brokerage firms, pharmaceutical companies and multinational corporations to realize the benefits of the latest networking technologies by allowing them to distribute information securely over any type of network. Our combined hardware and software solutions are transparent, having no impact on users, applications, or network performance. Our reliable technical service team makes it happen.



Cylink's family of security products allows you to implement the five elements of a corporate network, shown above

Imagine the possibilities a secure network can deliver:

- *Access ATM, Frame Relay, TCP/IP, X.25, and other technologies*
- *Enable customers to investigate your products and services electronically*
- *Allow external personnel to exchange on-line information with the home office*
- *Share discreet technologies with strategic partners*
- *Create a more efficient network*

We understand your business and security needs. Let us create a comprehensive security solution for your network. Call today or visit our web site.

CYLINK.

World Leader in Enterprise Security Solutions and Wireless Communications

Cylink offers sales and service through a worldwide network of direct sales and business partners.

910 Hermosa Court, Sunnyvale, CA 94086 • Tel: (408) 735-5800 • Fax: (408) 720-8294 • Fax on Demand: (USA) 800-735-6614 (#290)
(Int'l) 408-735-6614 (#290) • E-mail: Info@cylink.com http://www.cylink.com
Cylink U.K. Tel: +44-1256-841919 • Fax: +44-1256-24156 • Cylink Singapore Tel: 65-297-6196 Fax: 65-297-6195

Marketplace

Intranets don't have to be costly

IS organizations already have a lot of resources at their fingertips

By Amy Malloy

If you want to set up an intranet, you should start by looking around the office. Existing resources and equipment often prove adequate for a company's first attempt at an intranet, which is a private Internet for exchanging information within an organization.

For example, a company can use an old PC to set up a server, tap employees for ideas and topics, download freeware and use the same server for the Internet and an intranet.

If space is available, an intranet can be built on an existing server. If not, it's inexpensive to set one up. "Any old spare computer, generally a PC, can be used to set up a Web server," says Ira Machefsky, an Internet analyst at Giga Information Group in Santa Clara, Calif.

"If a company had systems that had space on them, there would be almost no software or hardware costs. If it had to put a system in, it may spend $6,000 for hardware," says Tim Sloane, director of Internet messaging at Aberdeen Group, Inc. in Boston.

Existing network access is key

If a company is already networked and connected to the Internet, setting up an intranet shouldn't be too costly.

"The real cost is ensuring that everyone has network access," says Stan LePeak, program director at market research firm Meta Group, Inc. in Stamford, Conn.

"To use freeware effectively, you need employees [who] are knowledgeable."

— Tim Sloane, director of Internet messaging, Aberdeen Group

"Having TCP/IP or some kind of protocol on the network — that is 90% of the battle," agrees Clay Ryder, an analyst at Zona Research, Inc. in Redwood City, Calif.

Freeware pluses and minuses

For some companies, freeware is another way to save money. There are advantages and disadvantages to using freeware. The practicality of its use depends on the company and its information systems expertise.

"To use freeware effectively, you need employees [who] are knowledgeable," Sloane says. If a company has such resources, he says, it needs to ask, "Is that where we want to put these valuable people, or do we want to bring in technology from a vendor?"

Besides, as LePeak points out, "Most of the off-the-shelf products are free or cheap."

Start slowly

A company can start out inexpensively and later move the system to a more advanced platform. The open nature of the Internet makes such upgrades easier than upgrades undertaken with other technologies.

"Once a company gets its feet wet, it can go to products that improve the efficiency of the organization," LePeak says.

Analysts recommend testing the waters and stress that companies don't need a full-blown intranet to start. "Given the fact that you can download evaluation software, companies can start experimenting on this. The intranet can then be moved to a more substantial system and environment," Machefsky says.

Talk to the users

Employee input should be incorporated into the planning process. With user advice, companies can avoid taking wrong turns with the intranet. "Get a dialogue going where there had been animosity in the past," Sloane says.

Departments should build on what other departments have done. For instance, "If [the IS department] put up an intranet, you want to piggyback [human resources] on that," LePeak says.

The thing to remember, analysts say, is that an intranet is a work in progress. They recommend starting small. Upper management doesn't have to plan an intranet well in advance. "The Internet is a grassroots kind of phenomenon," Machefsky says.

Getting ready for an intranet

Before a company even examines cost savings with an intranet, it needs to acclimate employees. Sloane suggests the following format:

- ▶ Get the Internet in front of as many business units as possible so they become aware of its capabilities.
- ▶ Build a community of users, and start a discussion group through news groups or Lotus Notes so employees can discuss intranet pros and cons.
- ▶ Once the need for an intranet is established, IS can implement it. ■

Malloy is *Computerworld*'s assistant researcher.

COMPUTERWORLD Marketplace Vendor Center

A FREE SERVICE for your random shaft's as easy as... ● Call the Computerworld Marketplace Vendor Center at (800) 447-0018. ● Ask for the extension listed in the product area you want information on. ● Sit back and relax – your requested information is on the way.

(800) 447-0018

Software

3780 RJE Emulation	ext. 517
Client/Server Development Tools	ext. 509
Groupware	ext. 511
Network Management	ext. 512
PC-to-Host Connectivity	ext. 520
Remote Access	ext. 513
Security	ext. 516
Terminal Emulation	ext. 518
Utilities/Antivirus	ext. 502
Year 2000	ext. 519

Computers/Peripherals

Back-up/Tape/Disk	ext. 216
Cabinets/Racks/ Desktop PCs	ext. 201
Furniture	ext. 220
Hooks	ext. 217
Mainframes	ext. 215
Midrange	ext. 219
Presentation/ Projectors/Panels	ext. 205
Repairs and Maintenance	ext. 221
Security	ext. 218
Servers	ext. 214
Spark Microprocessors	ext. 222
Storage/RAID/ DAT/Optical	ext. 209
Tapes/Disk Drives	ext. 207
Workstations	ext. 203

Networking/Communications

Client/Server Tools	ext. 603
Diagnostic/Testing Equipment	ext. 629
Ethernet	ext. 623
Groupware	ext. 606
Hubs	ext. 628
Internet Products/Services	ext. 634
Network Hardware	ext. 619
Network Management	ext. 607
Network Software	ext. 618
Networking/Communications TCP/IP Applications	ext. 626
Remote Access	ext. 608
Security	ext. 632
Storage/Cabinets/LAN Racks	ext. 615
Switches/Gateways/ Bridges/Routers	ext. 612
Windows NT	ext. 617

Services

Consulting/Contract Programming	ext. 703
Conversions	ext. 707
Data Recovery	ext. 708
Outsourcing/Remote Computing	ext. 706
Training/ Software Support	ext. 704
Year 2000	ext. 710

Internet/Intranet

Application Development Tools	ext. 330
Browsers	ext. 305
Consulting	ext. 308
E-Mail Gateway	ext. 311
Encryption	ext. 312
Firewalls	ext. 314
Security	ext. 522

Get detailed product information direct from a variety of manufacturers.

TO ADVERTISE, Call toll free: 1-800-343-6474 Ext. 7744

premier solutions

Go Direct For Great Presentations

GO DIRECTLY TO THE SOURCE FOR THE LOWEST PRICES AND THE BEST SERVICE.

PROCOLOR 3080

$6499 Business Lease* $190/Month

250 lumens 10.5 lbs.

640x480 (800x600 compressed)

BEACON 2500

$5999 Business Lease* $190/Month

2000 lumens 20 lbs.

REVOLUTION

$6499 Business Lease* $190/Month

2000 lumens 13.8 lbs.

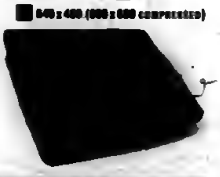
True 800x600

PROCOLOR 2001

$4999 Business Lease* $150/Month

250 lumens 16 lbs.

640x480 (800x600 compressed)



PROCOLOR 1820

$2499 Business Lease* $75/Month

LCD 10.4" diagonal 6.5 lbs.

640x480

BOXLIGHT CORP.

Presenting A Better Way.™

Government: (800) 497-4009
Resellers: (800) 736-6956
International: (360) 779-7901
Rental: (800) 736-6954

Fax: (360) 779-3299
Education: (800) 689-6676

http://www.boxlight.com

TO ORDER, CALL

1 800 762 5757

Monday - Friday, 8am - 5pm PST. Purchase orders accepted.
Prices subject to change. Quantities may be limited to stock on hand.

Attention SynOptics System 3000 Customers

New Ethernet Desktop Switching, Shared Fast Ethernet Modules,

and

A Special Limited Time Offer For System 3000 Customers Only!

Visit our Web site at: http://www.baynetworks.com/s3000
or call 1-800-231-4208 or your local reseller for more details.

Bay Networks
People connect with us

A Great Buy Opportunity!

© 1996 Bay Networks, Inc. "People connect with us" is a trademark of Bay Networks, Inc.

Distinct NFS 95

Easiest way to Share Files, Programs and Printers

Highlights:

- Integrates seamlessly into Windows 95
- Mounts NFS drives from Explorer or Network Neighborhood
- Supports file and record locking
- Allows central authentication with a single server running PCNFSD for all NFS connectivity
- Prints to NFS or LPD print servers
- Allows login to all systems with a single login name and password or different login names for each system
- Allows single-operation logout of all systems accessed through Network Neighborhood
- Fine tunes performance parameters for each server you access!

Free Evaluation Copy Available at...

distinct

408.366.8933

http://www.distinct.com

fax: 408.366.0153

E-mail: cworld@distinct.com

Fastfacts: 408.366.2101

Finish Out Your Rack with a Magnum Commander

- Control up to 96 file servers with 1 keyboard, monitor and mouse
- AutoBoot™ feature boots all computers without user intervention
- 3.5" unit is designed for 19, 23, and 24" rack applications
- Each unit controls up to 16 file servers; cascade up to 6 units
- Push-button and keyboard controlled scanning standard
- Supports all 100% IBM compatible PCs and PS/2 or serial mice; integral Sun and optional Mac support available
- Control all attached computers locally, remotely, or both; rear peripheral access available

MAGNUM COMMANDER™

Cybex Computer Products Corporation
4912 Research Drive
Huntsville AL 35805 USA
1-800-932-9239 (205) 430-4030 fax
http://www.cybex.com

CYBEX

IBM, PC, and PS/2 are registered trademarks of International Business Machines Corporation. MacIntosh is a registered trademark of Apple Computer, Inc. Sun is a trademark of Sun Microsystems. The Inc. 500 logo is a registered trademark of Gale Research Group. Cybex, Commander, and AutoBoot are trademarks of Cybex Computer Products Corporation.

Dealer Program Available

Made in the USA

ALICOMP

Has a SMALL BUSINESS DIVISION which has serviced over 165 diverse clients. It specializes in providing VM, MVS, VSE service to clients who need:

•OUTSOURCING (Up to 10 MIPS)
•REMOTE COMPUTING
•TAPE CONVERSIONS
•SYSTEMS INTEGRATION CONSULTING
•YEAR 2000 SERVICES: Impact Studies and Automated Tools

We are the "Boutique" of the Computer Services World

(201) 319-8787 • (800) 274-5556

DATA INTERCHANGE and BACKUP SOLUTIONS SPECIALISTS

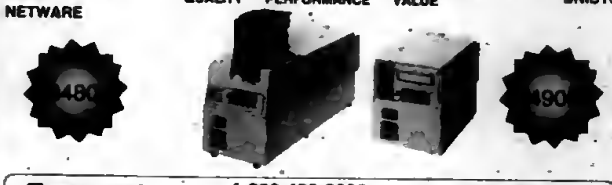
PC
HP
SGI
MAC
AS400
RS6000
NETWARE

QUALSTAR The Tape Experts

FUJITSU

DG
DEC
SUN
AT&T
SPARC
UNISYS

The World's Best Tape Drives from the Tape Experts
QUALITY PERFORMANCE VALUE



QUALSTAR The Tape Experts

1-800-468-0680
www.qualstar.com

FAX: (818) 592-0118
TEL: (818) 592-0061

Sales & Rentals

- ✓ Processors
- ✓ Peripherals
- ✓ Upgrades
- ✓ New
- ✓ Reconditioned
  With warranty

Dempsey BUSINESS SYSTEMS

2136 Michelson Drive • Irvine, CA 92612-1304
Phone: (714) 475-2900 Fax: (714) 475-2929

Buy • Sell • Rent (800) 888-2000

TO ADVERTISE, Call toll free: 1-800-343-6474 Ext. 7744

DATA RECOVERY: 800 440-1904

Seven good reasons to choose DriveSavers:

1. We're the most trusted and respected Data Recovery Specialists
2. We offer 24-hour, onsite, and weekend service
3. We've developed proprietary techniques so advanced we can retrieve data others might simply abandon
4. We're certified by most major drive manufacturers to maintain drive warranties
5. We've been restoring data–and peace of mind–since 1985
6. Our amazing data recovery success stories have been featured in dozens of magazines and newspapers from *Forbes* and *USA Today* to *The Los Angeles Times*, and television shows such as CNN, CINet, NextStep, and MS/NBC
7. We specialize in all storage devices; DOS, Win95, WinNT, OS/2, Mac OS, UNIX, Sun, SGI, Novell

Call when you need us, or visit DriveSavers at: www.drivesavers.com

Advertiser's Index

Altcomp/CBS	(800) 274-5556	125
Bay Networks, Inc	http://www.baynetworks.com/s3000	124
Boxlight Direct	http://www.boxlight.com	124
Cybex Computer Products Corp	http://www.cybex.com	125
Cylink	http://www.cylink.com	122
Dempsey	http://www.dempseybus.com	125
Distinct Corp	http://www.distinct.com	125
DriveSavers	http://www.drivesavers.com	126
Qualstar	http://www.qualstar.com	125

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

yes!

I want to reach over 768,000 buyers!

Please send me a FREE Computerworld Marketplace Media Kit!

Name: _____

Title: _____

Company: _____

Street: _____

City: _____ State: _____ Zip: _____

Phone: _____

E-mail: _____

Product: _____

_____

Fax this form to (508) 820-0941 or call (800) 343-6474, ext. 7744 and we'll mail you your information right away!

Computerworld, Inc

CEO/ President
Gary J. Beach

Senior Vice President/ Finance
Matthew C. Smith

Vice President/ Human Resources
Susan C. Perry

Executive Assistant to the CEO/President
Karen E. Elliott

Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

Executive Vice President/Publisher
Michael F. Rogers

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700, FAX: 508-875-4394

Editor
Paul Gillin

Vice-President Sales/ Associate Publisher
David Peterson

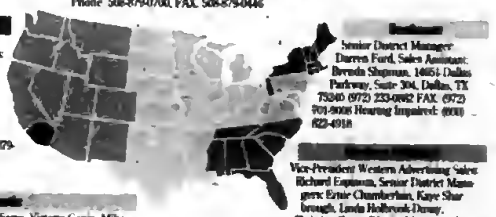
Vice-President Marketing
Bob Winter

Vice-President Consumer Marketing
Gail Odeneal

PUBLISHER'S OFFICE: *Assistant to the Publisher/Laureen Austermann* **MARKETING:** *Director, Marketing Communications/Mary Doyle, Senior Manager, Marketing Communications/Elizabeth Phillips, Manager, Trade Show & Conventions/Audrey Abbott, Marketing Manager/Susan Thanter, Marketing Communications Project Manager/Karen Lesko, Marketing Specialist/Emily Danneen, Administrative Assistant/Patty White* **CIRCULATION:** *Director of Circulation Management/Maureen Burke* **PRODUCTION:** *Production Director/Christopher P. Cuoco, Production Manager/Beverly Wolff* **SALES CLASSIFIED:** *Classified Operations Director/Cynthia Delany* **DISTRIBUTION:** *Distribution Manager/Bob Wescott, Traffic Manager/Pat Walker* **INFORMATION SYSTEMS:** *Vice-President of IS/Walter Crosby*

Sales Offices

Associate Publisher/Vice-President/Sales
David Peterson
Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171 Framingham, MA 01701-9171
Phone: 508-879-0700, FAX: 508-879-0446



Regional Vice President, Sherry Driscoll, Senior District Managers: Bill Cadigan, John Watts, District Manager: Isabelle Kane, Sales Office Coordinator: Tammy Bonnett, Sales Associate: Cheryl Stratton, Barbara Shuman, Diane McNeil, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154 (508) 879-0700 FAX: (617) 890-2080 Hearing Impaired: (800) 428-8244

Senior District Manager: Darren Ford, Sales Assistant: Brenda Shipman, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (972) 233-0982 FAX: (972) 701-9008 Hearing Impaired: (800) 422-4918

Vice-President Western Advertising Sales: Richard Espinosa, Senior District Managers: Ernie Chamberlain, Kaye Shar brough, Linda Holbrook Denny, Christine Curry, District Managers: Lisa Kowalski, Denyce Kehoe, HR Representative: Leticia Lelaine, Operations Manager: Denise Hsu, Account Executives: Shannon Dempsey, Andrea Zurek, Sales Associates: Tamara Haney, Emmie Hung, Amy Blechman, Todd Herrold, Marcy Walpert, Office Services: Jessica Abudy, Sales Coordinators: Yvonne Zuniga, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-6555 FAX: (415) 347-0312 Hearing Impaired: (800) 900-3179

Senior District Managers: Fred LeSagan, Victoria Genin, Mike Bachman, District Manager: Barry Cheney, Sales Associate: Susan Kvasz, Jean DeBarbieha, John Rastunnik, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786 Hearing Impaired: (800) 208-0288

Regional Vice President: Bernie Hockswender, Sales Assistant: Jennifer Puttemanie, 1565 Woodington Circle, Suite 201, Lawrenceville, GA 30244 (770) 931-8104 FAX: (770) 931-8106 Hearing Impaired: (800) 449-4874, Senior District Manager: Mike Bachman, Sales Assistant: Mary Cavaliere, 175 Strafford Ave #1, Wayne, PA 19087 (610) 975-4581 FAX: (610) 975-4582

District Manager: Nancy Coy-Bianchi, Account Executive: Susan Davis, Sales Associate: Pat Dahl, 2171 Campus Drive, Suite 100, Irvine, CA 92612 (714) 250-3942 FAX: (714) 476-8724

Senior District Manager: Sharon R. O'Brien, Sales Assistant: Denice Richards, 875 N. Michigan Avenue, Suite 2840, Chicago, IL 60611 (312) 943-4266 FAX: (312) 943-2214

Display Advertising Production Manager: Paula Wright, Display Advertising Coordinators: Lisa Tanner, Gregg Pinsky, (508) 879-0700 FAX: (508) 879-0446

Boston: Carolyn Medeiros, Project Coordinator/Heidi Bradley, Managing Editor/Peter Bochner, Graphic Designer/Gail Varney, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 875-6310

San Francisco: West Coast Director/Elaine R. Offenbach, Sales Associate/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-4312

Associate Publisher: James Hussey, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2564 **East:** Don Calamaro, 1856 Windsor Park Lane, Havertown, PA 19083 (610) 446-5372 FAX: (610) 446-5753

Sales Manager/Michelle Reeves, Sales Assistant/Christine Tremeau, Northeast Account Executive/Laurie Gomes, Central/Southeast Account Executive/Ann Mekosey, 500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474 FAX: (508) 820-8941 Western Account Executive/Claude Garbarino, 500 Airport Blvd., Suite 400, Burlingame, CA 94010 (415) 548-5544 FAX: (415) 343-5023

Vice President/General Manager: Richard Millen, Vice President: John Carpenter

Computerworld VAR Database: Carol Mullen/ National Sales Manager/ Account Executive/Sean Weglage, (508) 879-0700 FAX (508) 879-0164

Computerworld Buyers Database: East: Regional Manager, Database Services/Linda Clinton, (508) 879-0700 FAX: (508) 879-0164

Computerworld Buyers Database: West: Regional Manager/ Gerin Hass, (415) 347-0555 FAX (415) 347-4312

Vice President/Recruitment Advertising/John Corrigan, Marketing Director/Derek E. Hallenby, 500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474

New England: Regional Manager/Nancy Percival, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154 (800) 343-6474, Account Executive/Nancy Mack, (800) 343-6474

Mid-Atlantic: Regional Manager/Mary Finn, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090, Account Executive/Carys Hunt, (800) 343-6474 TDD: (800) 208-0288

South-Atlantic: Regional Manager/Katie Kress, 6804 Professional Hill Drive, Fairfax, VA 22033 (703) 573-4115, Sales Manager/Pauline Smith (800) 343-6474

Midwest: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (847) 827-4433, Sr. Account Executive/Ellen Cross (800) 343-6474 TDD: (800) 227-0437

West: Regional Manager/Barbara Murphy, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0104, Sr. Account Executive/ Christopher Glenn (800) 343-6474 TDD: (800) 203-5467

Internet Careers Site: Jay Savell, Account Executive, 500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474

500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474

National Accounts Director/Norma Tamburrino, Sales Associate/ Christine McGovern, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

Director/Elizabeth Cooper, Sales Associate/Nancy Dillon, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-6555 FAX: (415) 347-0312

Chairman of the Board, Patrick J. McGovern, **President,** Kelly Conlin; **Chief Operating Officer,** Jim Casella

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 275 computer publications in over 75 countries. Ninety million people read one or more International Data Group publications each month.

Advertisers Index

Advanced Logic Research 107
http://www.alr.com

AST Computer 61
http://www.ast.com

Cayenne Software Inc. C3
http://www.cayennesoft.com

Centura Software Corp. 98
(formerly Gupta)
http://www.gupta.com

Condisco 80-81
http://www.condisco.com

Compaq Computer Corp. 46-47, 58-59
http://www.compaq.com

Computer Associates 9, 18-19
http://www.cai.com

Compuware 22-23
http://www.compuware.com

Digital Equipment Corp. 9
http://www.digital.com

EMC Corp 25
http://www.emc.com

Exabyte 104
http://www.exabyte.com

Forté 21
http://www.forte.com

Hewlett-Packard 34-35, 42
http://www.hp.com

IBM 26-27, 95, 136
http://www.ibm.com

In Focus Systems 13
http://www.infocus.com

Information Builders 55, 57
http://www.ibi.com

Informix 17
http://www.informix.com

Innovation Data Processing 7
http://www.innovationdp.fdr.com

Intersolv 48/49
http://www.intersolv.com

Lawson Software 61
http://www.lawson.com
(800)477-1357

Lotus Development Corp. 70-71, 89
http://www.lotus.com
(800) 343-5414

Lucent Technologies 78-79
http://www.lucent.com

MCI 10
http://www.mci.com

Micro Focus 11
http://www.microfocus.com
(800) 872-6265

Micrografx 60
http://www.micrografx.com

Micron 62
http://www.micron.com

Motorola 31,128
http://www.motorola.com

NCR 25
http://www.ncr.com
(800)CALL-NCR x3000

NEC Technologies 36
http://www.nec.com

NetManage 77
http://www.netmanage.com

Netscape 72
http://www.netscape.com

Nokia Display Products 43
http://www.nokia.inthech.com
(800)BYNOKIA

Novadigm 84
http://www.novadigm.com

Novell 65, 67, 69
http://www.novell.com

Open Market 74-75
http://www.openmarket.com

Oracle Corp. 5
http://www.oracle.com
(800)944-0094

Powersoft 13, 38-39
http://www.powersoft.com

Progress Software 52-53
http://www.progress.com

Pure Atria 132
http://www.pureatria.com

SAS Institute 82-83
http://www.sas.com

SCO 50
http://www.sco.com

Seer Technology C4
http://www.seer.com

Silicon Graphics 101
http://www.sgi.com

Sprint 134
http://www.sprint.com

StorageTek 44
http://www.storagetek.com

Tech Corps 40

Texas Instruments 37
http://www.ti.com

Unisys 86-87
http://www.unisys.com
(800) 874-8647 X100

To have your Internet address listed here, please contact Paula Wright at (508) 620-7716
This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:
COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.
Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription
All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here Address shown: ❑ Home ❑ Business

Name
Company
Address
City State Zip

Other Questions and Problems
It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: 1-800-669-1002 (Outside U.S. call (614) 382-3322) CompuServe members can reach us at account number 73373, 1230. Internet address: circulation@cw.com

COMPUTERWORLD allows advertisers and other companies to use its mailing list for selected offers we feel would be of interest to you. We screen these offers carefully. If you do not want to remain on the promotion list please write to the following address - COMPUTERWORLD, Circulation Department, 500 Old Connecticut Path, Framingham, MA 01701

Name
Title
Company
Address
City
State
Zip

Introducing three things you might not expect from Motorola.

Mac OS, Windows NT and AIX. All now available with PowerPC performance.

Motorola's been making everything from chips to motherboards for years. Truth is, the Motorola name stands for quality and innovation in everything we do. So leave it to us to introduce the very first line of computers which includes systems running Windows NT,® AIX® and Mac® OS. All running on the PowerPC™ microprocessor—the one that outperformed Pentium® and Pentium® Pro processors in a recent BYTE *magazine performance test.*†

And one you would.

The industry's only five-year system warranty.

With the only five-year warranty in the computer industry, we're making PowerPC™ *Motorola the name to look for in systems and servers. Which brings us to yet another thing you might expect from us: computers that are among the industry's lowest-priced systems of this quality and power. Call and ask how you can order any of our systems and servers. We'll be expecting your call.*

1-800-759-1107 ext. CW
http://www.mot.com/computer/

StarMax *for Mac OS* PowerStack II *for Windows NT and AIX.*

MOTOROLA
Computer Group

What you never thought possible.™

©1996 Motorola, Inc. All rights reserved. Motorola and Ⓜ are registered trademarks of Motorola, Inc. PowerPC and the PowerPC logo are trademarks of International Business Machines Corporation, used under license therefrom. All other brand and product names are the trademarks or registered trademarks of their respective holders. †BYTE magazine, August 1996, used with permission.

LAN vendors move into WAN territory, 131

Finance & Investing

Next week: A 'Foolish' review

Investor Power!

While most investors go online to quietly research stocks or chat with colleagues, an increasing number are hoping to use the online forums to make a whole lot of noise.

Welcome to a new era of investor empowerment, where individual investors gather online and collectively speak out against companies or brokers when they are unhappy with them or suspect wrongdoing.

"You could write a letter to a CEO that will be read and answered by some low-level administrator, or you could go in together and send something [as a group] that means more," says Trey McAtee, a member of the Silicon Investor forum (www.techstocks.com) and a stockholder in several high-technology companies.

By Julie Bort

In recent months, there have been several incidents of investors banding together to throw their weight around. None of these has turned the industry on its ear. Nonetheless, they demonstrate the potential power of online investor activism, observers say.

For example, two Banyan Systems, Inc. stockholders earlier this year posted notices on various online forums to encourage other stockholders to vote against David Mahoney, the company's chairman, if they were dissatisfied with the networking firm's performance. Banyan's stock, which had once traded as high as $26 per share, was down to about $6 at that time.

One of the posters, Jerrold Patz, said he received about 150 responses from other disgruntled stockholders. While Mahoney was reinstated by an overwhelming majority at the company's annual meeting at midyear, the effort showed Banyan that "there is more scrutiny on them," Patz says.

Feedback is feedback

In response, Banyan is diplomatic. "Positive or negative, you want to know what investors are thinking," says Ron Schneider, director of treasury operations. Online forums "give them a more unified voice in approaching management," he says.

Another example took place on the Silicon Investor World Wide Web site. It involved ETrade Securities, Inc., an online brokerage firm in Palo Alto, Calif., and a dissatisfied customer.

The customer, identified online as Blaine Flaherty, posted notices on Silicon Investor forums seeking other unhappy ETrade customers who would consider a class-action suit against the online brokerage firm.

Flaherty, who wasn't available for comment, claimed in online postings that ETrade's poor service had caused him to lose money. Flaherty received numerous responses from other ETrade customers claiming they had experienced similar troubles with ETrade. Thus far, however, a lawsuit hasn't been filed.

An ETrade spokeswoman says the company is aware of this online activity. "It's like the Wild West," says Rebecca Patton, senior vice president of marketing at ETrade, of online forums. "It's completely free, and there are no rules. [This customer] is using the forum to solicit interest in filing a lawsuit, and that's not illegal. But it's an interesting use of the forum."

Investors say online forums are an inexpensive and efficient way of getting themselves heard.

Patz says it would have cost him thousands of dollars to hunt down Banyan stockholder mailing lists and send individual notices. But by posting messages online, "I could reach tens of thousands of people at no cost," he notes.

> "Investors are able to contact people they could never have reached."
>
> — Michael Gutierrez, American Association of Individual Investors

However, not everyone agrees that online activism is good news for the industry.

A spokesman for the National Association of Investors Corp. (NAIC) says online forums and discussion groups aren't intended to rally troops of investors for protest. "It seems to me that the spirit of online forums is to share information," says Herb Barnett, president of the NAIC's computer group, which handles the association's Web site (www.better-investing.org) and its forum on CompuServe.

"When someone starts running a crusade, it not only turns people off who are there for advice and information, but it puts the whole thing in a bad light," he says.

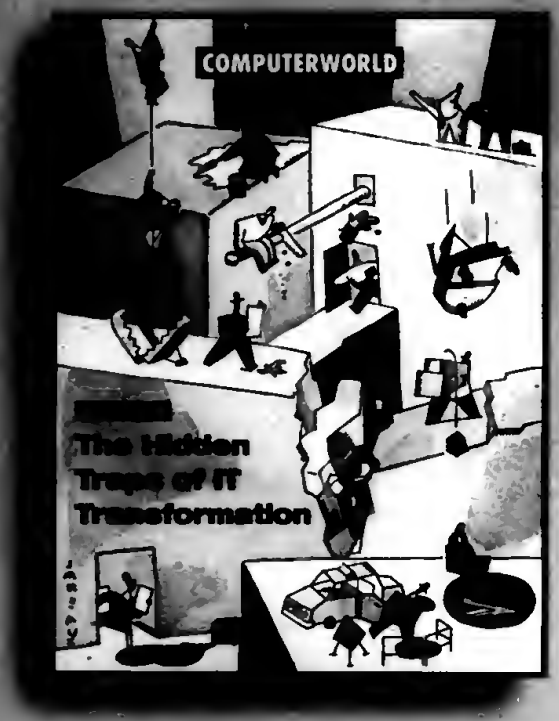
Other observers contend that reaching out to others is exactly what the Internet is all about. "For communication, [online forums] are an excellent resource," declares Michael Gutierrez, associate editor of the American Association of Individual Investors, Inc.'s "Computerized Investing" publication. "Investors are able to contact people they could never have reached."

And activists such as Patz say they conduct themselves professionally and give other investors the option to respond or not.

"What we did was post an open letter," Patz says. "We didn't throw any bombs. There were no pitchforks, no hangings. We didn't send a bazillion E-mails to aggravate people."

Bort is a freelance writer in Dillon, Colo.

Don't miss Computerworld's Leadership Series



Coming in the October 21st issue of Computerworld...

[redacted]

Smart CIOs know managing change is tough. No matter how much they prepare and plan, most CIOs still fall victim to a few well-hidden traps. Consultant and author Ann Senn, a principal at Deloitte & Touche, shows how to find the snares and snake pits before they sabotage your mega-projects and ruin your reputation.

Previous Articles Available

Governance: The New IS Agenda by Paul A. Strassmann
The Role of the CIO in IT Decisions by Bill Carico
Transforming the CIO by Thomas H. Davenport
Knowledge, Information, Learning and the IS Manager by Christopher Gopal and Joseph Gagnon
Into the Intranet by Glover Ferguson
The Eastern Road to IT by Shuji Honjo
The Enterprise Engineer by James Martin
Building an IT Management Flight Deck by Howard A. Rubin
Rebuilding the IS Organization by Robert A. Zawacki
The Reconstruction of IT by Ernest M. von Simson
The New CIO/CEO Partnership by Harry M. Lasker and David P. Norton
Evaluating the CIO by Thomas J. Buckholtz
Staffing for the Future: A Leadership Roundtable by Bruce Rayner
Chaos and the IS Executive by Christopher Meyer
The New Organizational Operating System by N. Dean Meyer
The Future of Moore's Law by Gordon E. Moore and Bruce Rayner
Assembling the Renaissance Executive by Julia King and Robert L. Scheier
The Internet: Managing the Connection by Randy Weston

To Request a Copy of Previous Leadership Series Articles

Contact Sharon Bryant, Computerworld reprints manager, (508) 820-8125, fax: (508) 875-8931, or email her at sharon_bryant@cw.com. Copies of previous Leadership Series articles are available for $4 each plus postage.

Published by:

COMPUTERWORLD
Everything you need to know.

Sponsored by:

HEWLETT® PACKARD

The Week in Stocks

Gainers

PERCENT

Data Race Inc. (H)	54.0
Pinnacle Micro Inc.	41.7
NetFrame	40.9
Cheyenne Software Inc. (H)	37.1
Cirrus Logic	32.6
Computervision Corp.	31.3
Elscint (H)	30.9
Sybase Inc. (L)	30.7

DOLLAR

Seagate Technology	9.25
Cheyenne Software Inc. (H)	8.25
Security Dynamics Tech.	7.75
Sterling Software Inc.	6.88
Lexmark Tech. (H)	6.38
Adaptec Inc. (H)	6.38
Newbridge Networks Corp.	6.25
Cirrus Logic	6.25

Losers

PERCENT

PairGain Systems Inc. (L)	-34.2
Logic Works (L)	-33.3
Software Publishing Corp.	-33.3
MathSoft (L)	-19.7
Shiva Corp.	-18.9
America On-Line	-17.8
Xylan Corp.	-16.4
Bay Networks	-15.9

DOLLAR

Shiva Corp.	-10.75
Cascade Communications (H)	-10.38
Xylan Corp.	-9.50
America On-Line	-5.25
Oak Computer Corp.	-3.50
Computer Horizons	-3.50
3D Systems	-3.38
Mitrel Semiconductor Inc.	-3.38

Industry Almanac

LAN WANna-bes get boost

Diversify or die.

Although the stakes aren't quite that high, internetworking vendors are dropping big money on companies whose products let users tie LANs and campus networks to wide-area networks.

Diversification is also apparently good news for internetworking stocks, which continue to climb as more vendors enter the WAN equipment market. Overall, internetworking stocks have been up in the past month. One key reason: Analysts consider the WAN equipment business a gold mine.

3Com Corp. (Nasdaq:COMS) stepped forward last week and proposed a $245 million acquisition of privately held WAN access products maker **Onstream Networks, Inc.** in what would be the second LAN/WAN marriage in a month. After that announcement, 3Com's stock increased more than 2%, from $65.13 to $66.88 per share.

Although **3Com, Cabletron Systems, Inc. (NYSE:CS), Bay Networks, Inc. (Nasdaq:BNET)** and **Cisco Systems, Inc. (Nasdaq:CSCO)** have made their money on LAN products such as hubs, routers and switches, they are relatively new to the world of WANs.

"For the most part, these vendors know the LAN cold, but they don't know the WAN and are scurrying to beef up their presence in this key area," says Joe Noel, a technology analyst who tracks 3Com at Hambrecht & Quist, Inc. in San Francisco. "The Onstream acquisition will be a good fit for 3Com."

That's because 3Com sells Asynchronous Transfer Mode (ATM) switches that handle voice, data and video at high speeds on campus networks. Onstream, a Santa Clara, Calif., neighbor of 3Com's, makes products that link those ATM LANs to ATM WAN services offered by local and long-distance carriers.

Word of 3Com's intentions comes just a few weeks after Cabletron announced plans to acquire privately held **Netlink, Inc.** in Framingham, Mass., for about $160 million. Netlink makes WAN access devices for frame-relay WANs, which operate at lower speeds than ATM.

3Com's financial performance has improved over the past few years as the company diversified through mergers and acquisitions. 3Com posted $1 billion in revenue and a $10 million loss in fiscal 1994 but improved that to $2.3 billion in revenue and net income of $178 million in fiscal 1996.

"The WAN is the future for campus networking vendors, whether you're talking about connecting dispersed sites into a corporate data network or whether you're looking at Internet access," says Daniel Briere, president of TeleChoice, Inc., a Verona, N.J., consultancy. — *Bob Wallace*

Exch	52-Week Range			Oct. 11 Wk Net Wk Pct 2 Pm Change Change
COMS	80.25	13.50	3COM Corp (H)	67.75 2.00 6.4
AIT	90.88	49.63	AMERITECH Corp	55.63 0.63 1.1
T	80.88	57.50	AT & T	58.75 -0.63 -1.0
ASND	71.75	16.50	Ascend Communications	65.88 -0.50 -0.8
BAYN	13.63	4.50	Banyan Systems Inc. (L)	5.31 0.00 14.0
BAY	50.00	20.75	Bay Networks Inc.	27.50 2.63 10.0
BEL	60.38	42.50	Bell Atlantic Corp	58.88 2.13 3.6
BLS	45.88	38.25	BellSouth Corp	57.75 1.25 2.2
BRKT	38.25	6.88	Brooktrout Technology (H)	19.25 1.00 5.7
CS	87.25	53.00	Cabletron Systems	69.63 0.13 0.2
CSCC	91.25	34.00	Cascade Communications (H)	74.25 10.38 12.3
CGRN	25.13	12.25	Centigram Communications	14.50 -0.50 -3.5
CSCO	67.00	30.50	Cisco Systems Inc. (H)	65.25 -0.50 -0.8
CLIX	9.25	4.50	Compression Labs Inc.	5.81 -0.75 11.4
CMNT	30.50	6.00	Computer Network Tech.	5.63 -0.63 -10.0
XCOM	34.25	14.75	CrossComm (L)	15.40 -0.50 -3.1
DIGI	45.88	15.25	DSC Communications (L)	20.88 0.03 3.8
FORE	44.75	15.38	FORE Systems Inc.	30.75 1.75 -7.0
GDC	21.88	8.19	General Datacomm Inds.	11.00 -0.63 -5.4
GSIX	44.25	20.88	General Signal Networks	42.25 -0.61 -1.5
GTE	49.25	37.75	GTE Corp.	39.75 1.00 2.5
LU	47.63	29.75	Lucent Tech. (H)	47.63 1.38 50.1
MADGF	80.63	9.13	Madge Networks NV	11.50 0.75 7.0
MCIC	31.13	22.38	MCI Communications Corp	26.38 0.19 0.7
MMPI	34.50	3.50	Microcom Inc.	9.00 0.63 7.5
NETM	24.00	7.63	NetManage Inc.	7.88 -0.38 -4.5
NTRX	30.88	3.63	Netrix Corp	7.38 -0.25 -3.3
NCDI	10.75	1.88	Network Computing Devices	6.50 -0.50 -7.1
NWK	38.63	11.13	Network Equipment Tech.	13.75 0.75 5.8
NETG	27.88	15.00	Network General	24.25 0.63 2.6
NN	74.25	25.00	Newbridge Networks Corp	70.75 6.25 6.6
NT	62.00	31.50	Northern Telecom Ltd. (H)	61.63 2.75 4.7
NOVL	19.13	10.50	Novell Inc.	11.00 -0.25 -2.8
NYN	59.75	42.00	Nynex Corp	45.38 -2.75 -4.8
OCTL	31.75	12.63	Octel Communications Corp. (H)	29.00 1.25 4.1
ODSI	32.50	14.75	Optical Data Systems Inc. (L)	15.13 -0.50 -3.2
PAC	39.75	25.88	Pacific Telesis	33.75 -1.13 -3.2
PCTL	60.72	30.75	Picturetel Corp	38.00 2.00 5.6
PTON	9.25	2.38	Proteon Inc.	2.81 -0.06 -2.7
RACO	7.00	1.50	Racotek Inc.	5.75 -0.63 -9.8
RETX	18.88	1.81	Retix	7.50 0.13 1.7
SBC	80.75	59.00	SBC Communications	68.25 -1.50 -2.1
SFA	26.38	11.38	Scientific Atlanta Inc.	18.25 0.88 5.0
SHVA	87.25	31.13	Shiva Corp	46.00 -10.75 -18.9
FON	45.50	29.75	Sprint Corp	39.63 0.50 1.3
SMSC	23.50	50.25	Standard Microsystems Corp	15.13 1.00 7.0
TBIT	13.88	2.38	Telebit Corp	13.10 0.08 0.5
USRX	105.50	40.25	US Robotics	69.63 -3.38 -4.6
USW	40.38	27.25	US West Inc.	31.88 0.50 1.6
XIRC	20.63	8.88	Xircom (H)	20.63 3.50 20.0
XYLN	75.00	34.00	Xylan Corp	48.50 -9.50 -16.4
AALR	10.38	5.88	Advanced Logic Research	8.25 -0.25 -2.9
AAPL	62.50	36.00	Apple Computer Inc.	36.13 1.38 4.0
ASTA	50.25	6.00	ASI Research Inc.	5.00 0.00 0.0
CPQ	79.00	7.50	Compaq Computer Corp (L)	70.00 4.15 6.5
DELL	82.50	23.00	Dell Computer Corp	60.50 3.56 -4.2
GATE	50.13	18.00	Gateway 2000 Inc.	48.75 0.88 1.8
HWP	57.75	30.88	Hewlett Packard Co	45.88 3.00 7.0
MUEI	34.00	8.75	Micron Int'l Ltd.	22.00 0.38 1.9
NPNY	70.75	49.88	NEC America	58.88 0.88 1.8
SGI	80.75	20.00	Silicon Graphics	32.38 0.63 2.0
SUNW	67.13	26.38	Sun Microsystems Inc	46.88 2.63 6.1
AMH	13.50	6.75	Ambassador Corp	10.00 1.19 14.5
DGN	19.13	8.88	Data General Corp	16.50 1.00 7.6
DEC	39.50	30.50	Digital Equipment Corp.	35.38 1.19 3.3
IBM	130.50	81.13	IBM (H)	129.13 2.38 1.9
MDCO	20.25	6.50	Meridian Data Inc.	7.38 0.50 7.3
NTF	8.00	2.63	Network Frame	3.88 1.13 40.0
SQNT	19.13	10.13	Sequent Computer Sys.	12.88 0.25 2.0
SEQS	7.38	1.88	Sequoia Systems Inc.	2.50 0.06 2.6
SOA	24.13	16.63	Stratus Computer Inc.	22.88 0.00 0.0
TDM	15.25	8.38	Tandem Computers Inc.	13.50 0.50 0.0
UIS	8.25	5.38	Unisys Corp	7.75 0.75 11.5
ADBE	74.25	28.50	Adobe Systems Inc.	36.75 2.25 6.5
AMSWA	8.75	3.63	American Software Inc.	8.25 -0.38 -7.4
APLX	62.50	10.00	Applix Inc.	26.50 2.38 7.0
ARSW	39.75	6.75	Arbor Software	38.00 -2.25 -6.3
ADSK	64.75	18.50	Autodesk Inc.	22.75 -1.75 -7.1
BGSS	30.00	29.75	BGS Systems Inc.	43.50 0.50 0.0
BMCS	86.25	32.50	BMC Software Inc.	81.75 -3.00 -3.5
BOOL	26.75	19.38	Books And Babbage	26.00 1.00 4.0
BORL	21.25	5.75	Borland Int'l. Inc. (L)	8.31 -0.06 -1.0
BOBY	55.50	11.75	Business Objects	17.50 0.00 0.0
CAYN	11.88	6.00	Cayenne Software Inc	6.50 0.31 7.5
CYC	30.38	50.13	Cheyenne Software Inc. (H)	30.38 8.25 37.1
COGNF	34.13	9.75	Cognos Inc. (H)	31.88 -0.25 -0.8
CA	64.63	35.00	Computer Associates (H)	63.00 1.88 3.1
CVN	15.50	5.75	Computervision Corp	10.00 1.75 21.2
CPWR	48.00	15.50	Compuware Corp (H)	46.25 0.13 0.3
CSRE	52.00	10.75	Consinare Inc.	16.38 1.25 12.0
COSPF	19.11	8.00	Corel Corp (L)	8.88 0.63 7.8
DWTI	13.00	3.25	Data General Technologies Inc.	4.00 0.25 -6.7
FILE	67.00	20.00	Filenet Corp	29.00 3.00 11.6
FRTE	81.75	24.75	Forte Software	37.75 0.00 0.0
FTPS	40.63	5.88	FTP Software Inc.	7.38 0.25 3.5
GPTA	8.00	3.00	Gupta	6.38 0.00 0.0
HUMC	40.50	23.00	Humminbird Comm Ltd	32.00 -1.25 -3.8
HYSW	26.50	9.75	Hyperion Software Corp.	17.00 2.38 16.2
IFIC	36.75	30.00	Information Resources	33.25 -0.25 -2.0
IFMX	36.75	30.88	Informix Corp	30.88 -2.15 -7.5
INGR	20.13	8.63	Intergraph Corp.	10.88 -1.50 -12.6
LEAF	12.63	2.00	Interleaf Inc.	2.50 0.11 5.3
ISLI	22.00	7.50	Intersolv Inc.	8.63 0.38 4.5
INTU	99.25	27.25	Intuit Inc.	30.00 -1.00 -3.2
LGWX	22.25	5.00	Logic Works (L)	5.00 2.00 32.1
MAPS	23.00	7.50	Mapinfo Corp	21.25 0.25 2.3
MATH	9.25	3.75	MathSoft (L)	1.81 -0.94 -39.7
MCAF	29.13	17.63	McAfee Associates (H)	25.50 1.50 2.0
MENT	27.88	8.00	Mentor Graphics	9.31 0.13 1.4
MFGY	21.25	8.25	Micro Focus	13.75 1.50 12.2
MGKI	50.63	5.63	Microgate Inc.	5.81 -0.31 -5.1
MSFT	150.63	29.88	Microsoft Corp	126.13 -0.75 -0.2
ORCL	46.38	21.38	Oracle Corp. (H)	45.25 0.25 0.6
PRTC	54.50	25.88	Parametric Technology (H)	52.25 0.88 1.7
PARQ	14.63	2.75	ParcPlace Systems Inc. (L)	2.63 -1.38 -34.4
PSFT	89.25	34.75	Peoplesoft (H)	80.25 2.75 3.2
PTEC	20.38	9.88	Phoenix Technologies	17.75 0.13 0.7
PSQL	32.75	3.53	Platinum Software	11.25 0.50 4.7
PLAT	10.13	9.25	Platinum Technology	33.88 1.00 7.8
PROG	38.00	12.13	Progress Software Corp	16.88 -0.88 -0.6
RNBO	25.50	14.63	Random Technologies Inc	38.38 1.75 8.9
REDB	81.00	18.25	Red Brick Systems Inc.	24.00 -0.25 -1.0
SAPE	58.75	29.25	Sapient Corp	48.75 5.00 0.0
SCOC	9.13	5.50	SCO Inc.	7.25 0.63 9.6
SDTI	109.00	22.88	Security Dynamics Tech.	77.50 7.75 11.1
SKEY	45.63	19.38	Softkey International Inc.	59.88 1.88 4.8
SPCO	4.75	3.19	Software Publishing Corp	3.25 -0.38 -23.1
SQAI	38.75	16.00	SQA Inc	29.25 1.25 5.3
SQTA	19.75	9.00	State of the Art	12.88 0.81 6.7
SSW	81.38	28.25	Sterling Software Inc	30.50 4.88 19.0
SDRC	37.38	15.00	Struct. Dynamics Research	21.63 -0.75 -3.4
SYBS	39.25	13.50	Sybase Inc. (L)	17.88 3.88 29.7
SYNC	50.38	8.75	Symantec Corp	31.31 0.94 3.2
SMPS	50.50	23.00	SyncSorts	46.13 -1.13 -2.8
SSAX	24.38	8.25	System Software Assoc.	12.38 0.63 5.3
SYSV	38.50	3.38	Systemsoft Corp	10.38 3.13 3.8
TRUV	0.65	3.44	Thevenin Corp. (L)	1.00 0.50 30.7
VIEW	17.50	8.63	ViewLogic Systems (L)	9.13 0.38 4.3
VMRK	14.00	5.50	VMark Software Inc. (L)	8.00 -0.50 -7.7
WALK	16.50	6.25	Walker Interactive Systems (H)	14.25 1.00 7.5
WALL	27.38	12.25	Wall Data Inc. (L)	13.63 -0.38 -2.7
WANG	38.13	34.75	Wang Laboratories Inc.	37.25 0.13 0.4
AOL	71.00	24.25	America On-Line	24.25 5.25 17.8
BBN	48.75	15.63	BBN Corp	17.75 -0.50 -2.7
CSRV	35.50	20.75	Computerserve Corp	32.00 -0.75 -4.5
EDFY	55.75	16.25	Edify Corp	16.75 -2.38 -12.4
LCOS	29.75	6.75	Lycos Inc	11.63 0.38 3.3
NETC	81.50	15.00	Netcom On-Line	15.00 -1.75 -10.4
NSCP	87.00	29.11	Netscape Comm. Corp	48.75 -2.00 -4.2
OMKT	42.25	11.50	Open Market Inc.	18.25 0.50 2.7
PSIX	29.00	6.75	PSINet	10.00 1.00 9.1
QDEK	29.50	5.63	Quarterdeck Corp.	6.25 -0.38 -5.7
RAPT	30.25	12.75	Raptor Systems	22.25 3.25 17.1
SCUR	66.50	9.50	Security Computing Corp	10.50 -1.19 10.2
SPYG	41.00	12.00	Spyglass Inc.	17.13 1.38 7.8
YHOO	43.00	13.50	Yahoo! Inc	20.88 1.25 -5.6
AMD	28.50	10.25	Advanced Micro Devices	16.13 1.88 13.2
ADI	30.15	17.88	Analog Devices Inc.	28.13 1.25 4.7
CHPS	15.15	7.88	Chips and Technologies (H)	15.00 0.88 6.3
CRUS	51.50	12.63	Cirrus Logic	23.13 4.25 22.5
CY	10.61	0.15	Cypress Semiconductor Corp.	42.50 0.50 4.3
CYRIX	63.05	11.50	Cyrix	17.50 1.75 11.1
INTC	107.00	68.81	Intel Corp (H)	104.13 2.75 2.7
LSI	56.38	17.00	LSI Logic Corp	26.00 4.25 30.5
LSCC	60.63	19.75	Lattice Semiconductor	31.75 2.75 9.5
MCRL	26.00	12.00	Micrel Semiconductor Inc.	20.88 -3.38 -13.9
MU	77.38	16.41	Micron Technology	31.88 3.13 10.9
MOT	79.88	64.75	Motorola Inc.	68.50 0.25 0.5
NSM	27.88	13.00	National Semiconductor	20.13 0.75 3.9
TXN	77.00	60.50	Texas Instruments	75.75 3.50 4.7
VLSI	30.00	20.38	VLSI Technology	25.31 -0.31 -0.8
XLNX	49.00	23.25	Xilinx	25.88 2.81 9.5
ZLG	40.38	14.88	Zilog Inc	30.88 5.00 5.3
APCC	15.97	7.88	American Power Conversion	10.13 0.38 3.6
ADPT	64.13	75.00	Adaptec Inc. (H)	84.15 6.38 7.9
CBEX	10.61	3.00	Cabletron Corp	3.19 -0.31 -8.9
CREAF	12.88	3.50	Creative Technology Ltd	5.81 0.19 2.2
DACE	12.13	3.63	Data Race Inc. (H)	12.15 4.25 54.0
DTAK	8.88	4.13	Datakeb Corp	8.00 0.63 8.5
EMC	24.75	13.00	EMC Corp (H)	24.50 1.75 7.7
EMLX	25.38	6.38	Emulex Corp	17.00 0.38 2.9
ESCC	29.00	16.50	Evans and Sutherland	21.38 -0.50 1.6
EXBT	22.25	11.13	Exabyte	15.13 -2.13 -11.8
IOMG	55.13	3.13	Iomega Corp.	22.94 0.81 3.7
IPLS	8.25	1.50	IPL Systems Inc.	2.25 0.19 9.1
KMAG	37.00	17.63	Komag Inc.	28.15 1.13 4.2
MTSI	32.25	11.25	Micro Touch Systems Inc.	18.88 -0.25 -1.4
PEAK	34.75	51.75	Peak Technology Group (L)	12.00 -0.50 -4.0
PMCL	19.75	6.88	Pinnacle Micro Inc.	8.50 2.50 41.7
QMS	6.75	3.25	QMS Inc.	5.88 -0.25 -4.1
QNTM	26.13	10.88	Quantum Corp	19.50 1.88 10.6
RDUS	6.50	0.94	Radius Inc	5.50 -0.13 -7.7
SEG	87.75	36.15	Seagate Technology	67.00 9.75 16.0
STR	44.13	23.75	Storage Technology	43.63 1.88 4.7
STLC	8.75	1.25	Storagelogic Corp	1.94 -0.13 -6.3
TEX	41.88	29.75	Tektronix Inc.	40.25 1.00 2.6
WDC	60.00	14.38	Western Digital Corp. (H)	46.50 4.99 10.2
XIRC	58.25	30.88	Xircom Corp	55.88 -0.25 -0.6
AMSY	33.38	15.38	American Mgmt. Systems	20.38 -0.88 -3.8
ANLY	25.50	13.63	Analysts Int'l.	23.50 1.00 4.1
AUD	65.75	36.38	Auto Data Processing	62.88 -1.25 -1.9
BDMI	61.50	23.75	BDM International Inc.	56.88 2.63 4.6
CATP	32.75	13.88	Cambridge Tech. Partners	26.50 0.75 2.7
CEN	36.88	26.63	Ceridian Corp	32.88 0.38 1.2
CDO	33.00	19.75	Condisco Inc. (H)	31.63 1.00 3.3
CHRZ	54.00	11.63	Computer Horizons	26.94 -1.56 -12.5
ESC	81.88	63.13	Computer Sciences (H)	81.88 1.63 4.6
TSK	33.50	26.63	Computer Task Group	32.00 0.63 2.0
CPU	59.88	12.88	CompUSA Inc. (H)	57.88 1.50 2.5
CDAT	27.50	10.15	Control Data Systems Inc	26.75 1.00 3.5
EGGS	15.88	5.00	Egghead Discount Software	6.13 0.38 6.5
EDS	61.38	43.88	Electronic Data Systems Corp	61.88 1.25 2.1
IMAC	35.88	8.15	Imacon Corp	30.00 -0.31 -0.9
INEL	11.50	5.50	Intelligent Electronics	9.00 0.00 0.0
FEA	48.75	18.25	Kemi Inc.	47.00 0.63 1.1
MICA	19.75	7.25	Micropage Inc.	38.13 -0.63 3.5
PAYX	63.50	26.63	Paychex (H)	50.75 -1.38 -2.7
PMS	55.50	33.13	Policy Management Sys.	36.50 -0.63 -1.8
REY	28.25	16.88	Reynolds and Reynolds (H)	27.00 -1.13 -4.0
SCBI	30.50	14.44	SCB Computer Tech. Inc.	20.00 -0.12 -0.6
SEIC	30.38	17.75	SEI Corp	20.94 -1.38 -6.4
SAMD	72.13	57.38	Shared Medical Systems	55.63 -0.13 -0.2
SSPE	30.50	17.00	Software Spectrum Inc.	27.00 -1.63 -5.7
VST	20.63	8.00	VanStar Corp (H)	20.38 0.38 1.8
SMDY	46.75	26.25	Sungard Data Systems	45.50 -0.38 -0.8

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

Copyright Nordby International Inc., Boulder, Colorado
This information is based on sources believed to be reliable, and while extensive efforts are made to assure its accuracy, no guarantees can be made. Nordby International and Computerworld shall assume no liability for any inaccuracies. For information on Nordby's customized financial research services, call (303) 938-1877.

Pure and Atria have merged

No, the world hesn't changed.

Network television hesn't improved,

Taxes heven't become eny less peinful.

Your kids heven't reconsidered body piercing.

But the combinetion of our software diagnostic products,

software development enterprise producte,

end epplicetion testing products

hes created en Autometed Softwere Quelity solution

that will help your team work together more effectively.

Which means you'll be eble to build better eoftwere.

We've merged.

On eecond thought, meybe the world has chenged just a little.

PURE ATRIA

THE FOUNDATION FOR BETTER SOFTWARE

To find out more, visit eor web aite - www.poreatrie.com

© Pure Atria Corp. Our producte include Purify, Quentify, PureCoverage, CleerCeee, CleerCese MultiSite, CleerGuide, PureODTS, PureTeetExpert and PurePerformix.
We can alao be reached by calling (800) 353-7873.

How to contact Computerworld editors

Contacting us by phone

All editors can be contacted at our main phone number, (508) 879-0700, unless otherwise noted below. Our 24-hour news tip line is (508) 820-8555. For subscriptions, call (800) 669-1002, back issues, call (508) 820-8129, reprints, call (508) 820-8125. Our main fax number is (508) 875-8931.

Contacting us by E-mail

Our Web address is www.computerworld.com. All of our staff members can be reached via E-mail on the Internet using the form firstname_lastname@cw.com. For example, News editor Patricia Keefe is at patricia_keefe@cw.com. IDG News Service correspondents can be reached using the form firstname_lastname@idg.com. Subscription inquiries go to circulation@cw.com. Letters to the editor are welcome and should be sent to letters@cw.com. Please include your address and telephone number.

Contacting us by mail

Our postal address is PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

Contacting Computerworld editors

We invite our readers to call or write with comments and ideas. It is best to submit ideas to one of the department editors as well as to the appropriate beat reporter.

Editor — Paul Gillin (508) 820-7704
Executive Editor — Maryfran Johnson (508) 820-8179

Department Editors/News

News Editor — Patricia Keefe (508) 820-8183
Business Editor — Kevin Fogarty (508) 820-8246
Assistant News Editor — Neal Weinberg (508) 820-8177
Assistant Business Editor — Michael Goldberg (508) 620-7709
Online Editor — Johanna Ambrosio (508) 820-8153
Associate Editor, News — Mitch Betts (508) 347-6718

Senior Editors/News

Government and security — Gary H. Anthes (202) 347-0034
LANs, operating systems — Linda DiMio (508) 820-8182
Network/systems management — Patrick Dryden (617) 393-3485
Management — Thomas Hoffman (201) 587-0090
IS careers — Julia King (610) 532-7599
Internet — Elin S. Nash (714) 716-3822
Apple, software editor — Lisa Picarille (415) 347-0555
Databases — Craig Stedman (508) 820-8220
Hitachi mainframes, Unix operating systems — Johnathon Vijayan (508) 820-8235
Internet — Mitch Wagner (415) 548-5513
Internetworking — Bob Wallace (508) 820-8214

Senior Writers/News

Mobile computing, social issues — Mindy Blodgett (508) 820-8168
Application development, outsourcing — Sharon Gaudin (508) 820-8122
PCs, PC software — April Jacobs (508) 820-8121
Databases, high-end storage — Tim Ouellette (508) 820-8205

Staff Writers/News

@Computerworld — Stewart Deck (508) 820-8155
Telecommunications — Kim Girard (508) 820-8223
New products, multimedia, low-end storage — Matt Hamblen (508) 820-8247
@Computerworld, Client/server software, Unix apps — Justin Hibbard (415) 548-5515
Randy Weston (508) 620-4869

Opinions/Viewpoint

Technical Editor — Charles Babcock (215) 548-5512
Viewpoint Editor — Mitch Betts (508) 347-6718
Staff Columnist — Frank Hayes (505) 753-2100

Department Editors/Features

Technology reviews/Buyer's Guide — James Connolly (508) 820-8144

Senior Editors/Features

Managing — Allan E. Alter (508) 820-7714
In Depth — Steve Ulfelder (508) 620-7745
Corporate strategies — Joseph Maglitta (508) 820-8192
Management — Robert L. Scheier (508) 628-4731
Careers — David B. Weldon (508) 820-8188
Buyer's Guide — Cathleen Gagne (508) 620-7729
Forms & Networking — Rosemary Cafasso (508) 628-4715

Associate Editors/Features

Managing — Rick Saia (508) 820-8138

Research

Bob Fisk, senior research manager (508) 820-8141; Kevin Gordon, senior researcher; Linda Hunt, research analyst; Amy Mallory, assistant researcher; Stefanie McCann, senior graphics coordinator; Mel Roth, Pinegrove intern.

Copy Desk

Ellen Fanning, managing editor (508) 820-8170; Roberta Fusaro, assistant managing editor; Christine Alcardi Maguire, senior copy editor; Mike Schultz, Davis Chan, Kimberly Gilford, senior production copy editors; James Erickson, Pat Hyde, David Ramel, Jeremy Schwyer, copy editors. Monica Sambataro, online copy editor.

Graphic Design

Tom Monahan, design director (508) 820-8108; Janet Cameron, Mitchell Hayes, Nancy Rossi, senior graphic designers; David Waugh, Mary Beth Welch, graphic designers; Rich Tennant, John Pleasant, cartoonists.

Administrative Support

Linda Gorgone, office manager (ext. 8178); Connie Brown (ext. 8178), Lorraine Wetzel (ext. 8138), Rita Jones (ext. 8172), editorial assistants; Chris Flanagan, West Coast editorial assistant, (415) 548-5563.

Computerworld Magazines Group

(includes Premier 100, Campus Edition, Best Places to Work, Leadership Series, Internet Series, Client/Server Journal, Electronic Commerce Journal and vertical industry journals.)

Alan Alper, editor (508) 820-8115; Mary Brandel, executive editor; Anne McCrory, Catherine McCreevy, Joyce Chutchian-Fantozzi, managing editors; Kimberlee A. Smith, assistant managing editor and online coordinator; Stephanie Faucher, art director.

IDG News Service Correspondents

Paris bureau chief — Marc Ferranti (33) 1-4904-0301
Paris correspondent — Jacqueline Doran (33) 1-4904-7817
Munich correspondent — Torsten Busse (49) 89-811-8057
UK correspondent — Sian Cox-Jones (44) 181-460-0944
Tokyo correspondent — Rob Smith (81) 33-358-1422
Taipei correspondent — Tasha Ulmanan (88) 62-500-6523

Companies in this issue

Page number refers to page on which story begins. Company names can also be searched at www.computerworld.com.

3Com Corp. 66
ADC Kentrox 68
Adobe Systems, Inc. 16
Advanced RISC Machines Ltd. 10
Agile Networks, Inc. 6
AirTouch Communications, Inc. 66
Allen Lund Co. 83
American Association of Individual Investors, Inc. 129
American Bar Association 28
American Express Co. 30
American Stock Exchange 2
Americans for Tax Reform 30
Andersen Consulting 1
Apple Computer, Inc. 10,14, 20,24,137
Ardis Co. 63
Armstrong World Industries, Inc. 97
Around Technology, Inc. 80
Ashton Technology Group 88
AT&T Corp. 7,8,30,60,66,88
AT&T EasyCommerce Services 105
AT&T Network Communication Services 1
AuraVision Corp. 85
Avon Products, Inc. 88
Bank of America 6,93
BankAmerica Corp. 30
Banyan Systems, Inc. 129
Barnes & Noble 73
Baxter Healthcare Corp. 51
Bay Networks, Inc. 8,66
Bell Atlantic Corp. 111
Bell Atlantic Nynex Mobile 66
Blue Sky Software Corp. 81
Borland International, Inc. 54,100
Boston Edison Co. 14,68
Boston Scientific Corp. 15
Brewers Retail, Inc. 43
BroadBand Technologies, Inc. 111
Buck Consultants, Inc. 7
Buckman Laboratory International 76
Burlington Coat Factory Warehouse Corp. 8
Cabletron Systems, Inc. 12
California Department of Transportation 138
Cargill, Inc. 7,64
CBIC Wood Gundy 105
Central Maine Power Co. 68
Charles Schwab & Co. 88
ChatCom, Inc. 68
Chevron Corp. 51
Chevron Information Technology Co. 105
Cheyenne Software, Inc. 16
Chiron Corp. 99
Chubb & Son, Inc. 105
Cisco Systems, Inc. 83
Citadel Computer Systems, Inc. 68
Citibank 30
Claris Corp. 16
Cognos Corp. 16
Collabra Software, Inc. 15
Communications Network Architects, Inc. 8
Community ConneXion, Inc. 16
Compaq Computer Corp. 85
Computer Associates International, Inc. 16
Computer Horizons Corp. 88
Computer Sciences Corp. 42
Congress Financial Corp. 68
Control Data Systems, Inc. 64
Coopers & Lybrand 1
Corel Corp. 137
Corning, Inc. 97
Cray Computer Corp. 2,4
Crossroads Technologies, Inc. 2
Cumid & Co. 85
CyberManagement, Inc. 73
Data General Corp. 43
DataPro Personnel Consultants, Inc. 111
Dataquest 1,8,92
DayStar Digital, Inc. 20
Dean Witter Reynolds 24
DeltaPoint, Inc. 80
Digital Equipment Corp. 10,43, 54,60,63
Digital Switch Corp. 111
Dimension X, Inc. 2,60
Documentum, Inc. 51
Dolphin Interconnect Solutions, Inc. 43
DynCorp 28
ETrade Securities, Inc. 129
Earle M. Jorgensen Co. 1
Eastman Chemical Co. 97
Electronic Data Systems Corp. 30
Eli Lilly and Co. 7
EMC Corp. 12,93
Enigma Information 1
Retrieval Systems, Inc. 81
Entergy Services, Inc. 68
Enterprise Systems Ltd. 64
Equifax, Inc. 1
Exponential Technology, Inc. 20
Federal Express Corp. 6,8,97
Find/SVP 93
First Albany Corp. 135
FiTech, Inc. 80
FiveCom, Inc. 68
Flagstar Bank 85
Freeman Associates, Inc. 12
Fusion Systems Group, Inc. 42
G. W. Hunter, Inc. 1
Gambro Healthcare, Inc. 8
General Motors Corp. 97
GeoCities, Inc. 16
Hammer and Co. 30
Harbour Inn Convalescent Medical Center 20
HDS Network Systems, Inc. 6
Hewlett-Packard Co. 6,14, 16,63,66
Hitachi Data Systems Corp. 12
Hudson's Bay Co. 106
IBM 2,6,8,12,14,16, 20,43,51,54,60,76,97
IBM PC Co. 3
Imation Corp. 99
Informix Corp. 54
Insurance Services Offices, Inc. 43
Integrix, Inc. 80
Intel Corp. 20,43,54,66,85
Intermind Corp. 80
Internal Revenue Service 1,30
International Data Corp. 6,8, 12,14,16,42,43
Intuit, Inc. 2,6
Invesco Funds Group 138
IT Design USA, Inc. 80
J Stream 137
Kagan Telecom Associates 62
Kaiser Permanente Health Plan, Inc. 43
Kao Corp. 92
Kimmel Cancer Center 85
Kind and Gezin 99
Kronos, Inc. 111
Lands' End, Inc. 8
Larscom, Inc. 68
LearnKey, Inc. 80
Lehman Brothers, Inc. 42
Lockheed Martin Corp. 10
Lockheed Martin Missiles & Space 10
Lombard Brokerage, Inc. 42
Lotus Development Corp. 2,16, 63,76
Lucent Technologies, Inc. 8
Magic Software Enterprises, Inc. 54
Marimba, Inc. 60
MCA, Inc. 12
MCI Communications Corp. 7,8, 16,63
McKesson Corp. 51
Mercury Research 20
MetroPage 14
Michael Anthony Jewelers, Inc. 6
Micom Communications Corp. 63
Microsoft Corp. 1,2,6,8,14, 15,51,54,56,80,92,111,137
MicroTouch Systems, Inc. 45
Milliken & Co. 88
Millipore Corp. 6
Motorola, Inc. 20,63
MTX International, Inc. 56
NASA 82
National Commission on IRS Restructuring 30
National Research Council 1
NCR Corp. 8,43
Net2Net Corp. 66
NetPro Computing, Inc. 64
Netron, Inc. 105
Netscape Communications Corp. 8,14,54,73,80,15,137
NetSync Corp. 1
NetTech, Inc. 63
Network Engineering Technologies, Inc. 61
Nortel, Inc. 2,111
Novell, Inc. 54,66,68
Nuance Communications, Inc. 88
Nynex Corp. 42,68
O'Reilly & Associates, Inc. 100
Object Management Group 51
Oracle Corp. 2,6,8,51,54
P. L. Engineering 45
Pacific Bell 66
PC DOCS, Inc. 51
Peer Logic, Inc. 60
Philips Electronics North America Corp. 81
Power Computing Corp. 20
PR-Consult 61
Prentice Hall 112
Primeco Personal Communications 66
Procter & Gamble Co. 92
R. R. Donnelley & Sons Publishing Corp. 6
Racal-Datacom, Inc. 68
RCN, Inc. 68
Realty Highway, Inc. 60
Sanford C. Bernstein & Co. 24,105
SAP AG 88
Scotia Capital Market 73
SCT Education Systems 8
Sharp Electronics Corp. 43
Shell Services Co. 93
Silicon Graphics, Inc. 2,14
SohoSwitch, Inc. 16
Software Productivity Research, Inc. 88
Solectron Corp. 97
Source Services Corp. 111
Sourcecom Corp. 68
Sprint Corp. 7,66,111
Stil Consulting, Inc. 88
Storage Technology Corp. 12,43
Sumitomo Bank Ltd. 42
Sun Microsystems, Inc. 2,6,14, 15,42,43,60,88
SunSoft 137
Symantec Corp. 42,137
Tasty Fries 138
Technology Business Research, Inc. 6
Tektronix, Inc. 6
TeleChoice, Inc. 12,68
Texaco, Inc. 1
Texas Instruments, Inc. 1,97,105
The Information Management Forum 1
The Kendall Co. 93
The Philadelphia Stock Exchange 88
The Registry 12,66
The Good Guys, Inc. 14
Thinking Machines Corp. 2
Time, Inc. New Media 2
Tivoli Systems, Inc. 16
Toshiba American Information Systems, Inc. 1
Trade Compass 99
Traveling Software, Inc. 16
Tripod, Inc. 16
TRW, Inc. 30
U.S. Department of Justice 6
U.S. General Accounting Office 1
Umax Computer Corp. 28
Union Pacific Railroad Co. 42
United Technologies Corp. 30
Universal Press Syndicate 6
US West Communications, Inc. 76
VeriFone, Inc. 6
Verity, Inc. 68
Viacom International, Inc. 14
Viasoft, Inc. 135
Virtual Mortgage Network, Inc. 85
Vu/Text Library Services, Inc. 6
Wallace Co. 97
Welch Foods, Inc. 92
Wells Fargo Bank 8
Westinghouse Electric Corp. 97
Whirlpool Corp. 85
Wireless Computing Associates 66
Wohl Associates 92
Wolf Communications Co. 63
WorldCom, Inc. 83
Xerox Corp. 30,97
Xylan Corp. 68
Zeico Industries 138

We've got your city surrounded
and we mean business.

Sprint's bold deployment of self-healing SONET rings is anything but a cause for alarm–except for the competition. Because only Sprint offers four-fiber, bi-directional, line-switched ring topology throughout its entire domestic network. Which means your mission-critical data is protected to the fullest, automatically rerouted in as little as 50 milliseconds–less than the blink of an eye–even in the event of multiple fiber cuts or equipment failures. And with speeds at OC-48, we provide virtually unlimited capacity with no bottlenecks or blockages.

Only Sprint
has deployed international SONET ring technology for the highest standard in reliable data transmission.

And now, Sprint's application of broadband metropolitan access networks extends this survivability into local loops, directly to your offices. This means greater reliability and flexibility, all through a single point of contact. Sprint was not only first to deploy SONET-based rings domestically, but first to build international SONET rings. And since we employed fiber-optic technology from the start, we can continually expand bandwidth over our existing network. What's it all mean? You can count on us, because we mean business.

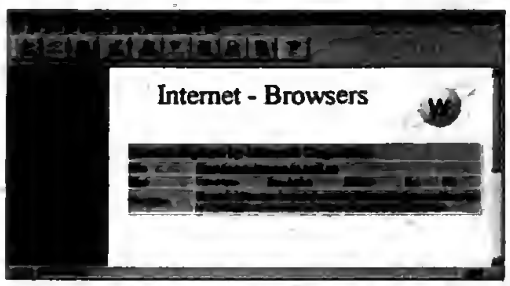
Call Sprint Business
1·800·588·DATA
www.sprint.com/data1

Sprint.

OFFICIAL TELECOMMUNICATIONS PROVIDER TO THE NFL

We help business do more business℠

©1996 Sprint Communications Company L.P. NFL and the NFL shield are registered trademarks of the National Football League



NetSync's Web site *offers its WebPatch Difference Engine — technology that allows users to download software updates*

Laptop bugs

CONTINUED FROM PAGE 1

time on quality," said Andrew Seybold, a mobile computing consultant in Boulder Creek, Calif.

Some of the problems come with the territory. Because laptops require more complicated manufacturing skills than desktops, they develop bugs more easily than PCs, industry observers said. And vendors have been caught off guard by skyrocketing demand for laptops.

"You're putting an awful lot of power into a very small box," said Mike McGuire, an analyst at Dataquest in San Jose, Calif. "And people throw them into overhead bins on airplanes. ... They're much more of an engineering challenge than desktops."

Laptops

TI traced the Extensa 500 problems to inferior metal used in the hard drive. Company officials said the problems have been fixed in its upgraded 570 line.

McWhirter said his Brea, Calif., firm is negotiating with TI for replacements. Though TI has been responsive, some damage has been done, he said. "Many of our users were pretty computer illiterate, and the many problems we have had have tarnished our ability to gain acceptance for the applications," he said.

TI isn't the only vendor users are complaining about. For instance, some users said ThinkPad 760 notebooks would lock up when they tried to type on external keyboards in a docking station. IBM PC Co. last week said it is shipping a fix — a cable adapter — to users.

Asmar Madyun, manager of desktop services at AT&T Network Communication Services in Berkeley Heights, N.J., said he has had Tecra 500s from Toshiba American Information Systems, Inc. in Irvine, Calif., that lock up while in use. Newer Tecra models, the 720s and 730s, have also had some problems, although they are fewer, Madyun said.

Toshiba officials said a BIOS upgrade and software configuration upgrades are available for the Tecra 500s on the firm's World Wide Web site: www.toshiba.com.

Laptop software and configuration issues can be equally confusing.

Bob Martin, information systems manager at G. W. Hunter, Inc. in King of Prussia, Pa., said it is impossible to keep track of all the updates and fixes in the market.

He was recently told to delay buying computers preconfigured with Windows 95 unless they included the OEM Service Release 2 that Microsoft Corp. recently issued. But he later found out that the release didn't apply to machines he would be buying.

Compaq Computer Corp. is trying to help its PC and laptop users by giving them CD-ROM-based decision-support information.

"We advise our customers buying any product to go ahead and check on our Web site for updated drivers," said Greg Young, senior software business manager at Compaq.

This week, NetSync Corp. in Carlsbad, Calif., planned to open its Web site (www.webpatch.com), offering its WebPatch Difference Engine — technology that allows users to download software updates.

But McGuire said, "As laptops become more prevalent, vendors will have to invest more in the fact that they actually work. There is no question these machines are much more complicated to make than desktops. But when someone is paying up to $7,000 for a laptop, they want it to be reliable."

Year 2000 skills offer long-term payoff

CONTINUED FROM PAGE 1

what make them such opportunities, Hall told attendees at Gartner Group's Symposium/ITxpo '96 in Lake Buena Vista, Fla., last week. For example, year 2000 managers must not only fix their systems so that they recognize four-digit years, but they also must make sure every related application at a supplier or a customer can tell the difference between 2001 and 1901.

IS careers

Just finding those systems is "a supply-chain issue, a business process analysis issue," Hall said. Going on to fix them will teach IS staff valuable lessons in risk management and project management, he added.

Chance to shine

"I personally see it as a career opportunity," said Carl Roecker, project leader for the corporate year 2000 team at Texaco, Inc. in Houston. It has given Roecker "an opportunity for exposure to upper management" that will grow as the year 2000 is recognized as more of a business issue than a technical problem, he explained.

For Lauris Nance, coordinating year 2000 work at credit information provider Equifax, Inc. in Atlanta allows her to work not only with business and technical experts, but also with "legal staff, marketing, corporate communications, your controllers, your auditors as well as your senior officers. It's very good exposure."

It also provides direct contact with outside customers the assistant vice president wouldn't meet if she didn't have to work with them to ensure their applications won't corrupt Equifax's year 2000-compliant systems.

After sharing some technical tips at a recent conference, for example, a major Equifax customer told Nance, "In the last 30 minutes, you saved me a minimum of three months' effort" in his year 2000 work.

"It can be career-limiting to always have an IS label," Nance said. "What you're doing is removing that label [so] people may place more value in your experience and your knowledge."

The global view of the enterprise gained through fixing an organization's year 2000 problems also makes IS managers more valuable in the future.

"There aren't a lot of people on that corporate ladder who would have a total enterprise perspective," Nance said. That's a point not lost on outside vendors who hope to use year 2000 contracts as a foothold to take future work away from internal IS departments.

"It's clear what they want to do," said Jim Jones, managing director at The Information Management Forum, an association of business and IS executives in Atlanta. Not only outsourcers but also consulting firms such as Coopers & Lybrand and Andersen Consulting are opening year 2000 practices "so they can come back later and say, 'Listen, we've had a chance to look at your entire information systems infrastructure'" and are thus perfectly suited to take over application maintenance.

This is a test

If IS managers can handle year 2000 conversion processes that involve tens or even hundreds of millions of lines of code, they will also have high-demand skills in areas such as project management.

"Think of all the ways year 2000 [work] teaches best practices," Hall said. He urges IS managers to "put your best people on the year 2000, not the people sitting on the bench."

Costs of ignoring year 2000 problem grow with company size. See page 88.

Year 2000 woes lead to higher prices

As customers start to spend heavily on year 2000 work, vendors are obliging by raising their prices.

"Heightened demand" was cited by IBS Conversions, Inc. for its plans to raise pricing on its code-scanning services by 10% to 15% in January, said Roger Byrnes, director of the Chicago-based consultancy. IBS Conversions' current scanning prices are 1 cent to 3 cents per line of code for nine languages, including IBM's AS/400 RPG and Cobol languages, Byrnes said.

Viasoft, Inc., a Phoenix-based year 2000 software and services vendor, plans to raise its software prices 30% to 60% in January. The price hikes cover the cost of supporting 15 to 20 additional programming languages rather than increased customer demand and "market panic," said Jean-Luc Valente, director of marketing at Viasoft.

As firms compete for increasingly scarce year 2000 resources, year 2000 prices will rise sharply, said Jim Duggan, technology director at First Albany Corp. in Stamford, Conn. He cited estimates from Meta Group, Inc. that the cost to convert each line of code will rise 25% to 30% next year and rise another 50% to $2 per line in 1998.

Some year 2000 vendors have offered to freeze prices for their customers in return for five- to 10-year contracts to maintain the systems they fixed, Duggan said. Those vendors, he said, are trying to "convert a single-incident kind of income into an [income] stream they can actually build a company on."

— Robert L. Scheier and Thomas Hoffman

Periodical postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #1963997. Computerworld (ISSN 0010-4841) is published weekly, except a single combined issue for the last two weeks in December by Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Copyright 1996 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $5.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Requests (customer code 0010-4841) and permission to reprint may be purchased from Sharon Bryant, Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within the first 3 issues after publication date. Subscription rates: $5.00 a copy U.S. — $48 a year; Canada — $100 a year; Central & So. America — $150 (surface); Asian Europe — $205 a year; all other countries — $295 a year. Subscriptions call toll-free (800) 669-1002. POSTMASTER: Send form 3579 (Change of Address) to Computerworld, P.O. Box 1602, Marion, OH 43305.

Introducing the IBM S/390 Multiprise 2000. It's just as impressive for what it doesn't do.

The IBM S/390 Multiprise 2000™ server looks like it does it all. But there are a few things it doesn't do. It doesn't take up much space, use lots of power or demand much time from your staff.

It also doesn't force you to buy loads of new software. The S/390 Multiprise server can handle just about whatever you're running now plus the latest UNIX,® client/server and S/390 programs. Even corporatewide LAN data is a simple interface away. And Internet and intranet transitions are easy. So business can grow with the S/390 Multiprise family.

What's more, it doesn't consume all your resources. The S/390 Multiprise saves up to 89% in floor space, 95% in energy costs and actually increases performance up to 40%.*

And it's all ready to go with our Entry Server Offering (ESO) packages. Which give you hardware, software, services, maintenance and financing at significant savings.

The new S/390 Multiprise 2000. If you want to be even more impressed, stop by and visit www.s390.ibm.com or give us a call at 1 800 IBM-2468, ext. CA254.

IBM.

Solutions for a small planet™

* As compared to the IBM 3090 class processor. Savings may vary depending on configuration. IBM and S/390 are registered trademarks and Multiprise 2000, OS/390 and Solutions for a small planet are trademarks of International Business Machines Corp. UNIX is a registered trademark in the United States and other countries licensed exclusively through X/Open Company Limited. All other product names are trademarks or registered trademarks of their respective companies. © 1996 IBM Corporation.

Netscape: Affirmative action for Unix, Mac?

There's a story about Bill Gates that has taken on so many of the qualities of an urban legend that only Bill himself knows whether it's true. In Microsoft's infancy, the tale goes, the company lost a $100,000 sale. Gates' response speaks volumes about competitiveness: "It's not just that we lost the $100,000," he is reported to have said, "it's that they got it."

Whether Chairman Bill said these words, I have little doubt he'd agree with them. Which brings the question: Why hasn't Netscape figured out that it's dumb to help the competition?

Every time someone downloads a Windows or NT version of a Netscape product, Netscape loses or only comes up equal, and Microsoft wins. Conversely, every time a piece of Netscape software is loaded on a Macintosh, Unix box or, soon, a network computer, Netscape wins and Microsoft loses. If this goes on long enough, Netscape will have dug itself a pretty big hole.

My idea is that Netscape should do more to promote its non-Microsoft platforms. When I recently suggested this to a group of Netscape executives, you'd have thought I'd dropped a snake on the lunch table — people fell over themselves trying to get away from me and my weirdo idea. I was stiffly told that the official Netscape policy is one of absolute platform neutrality.

But suppose Netscape changed its mind. What would such a change mean for customers? First, NT would no longer be the easy default choice for servers. Users would have to think about which server was best for which application. If Netscape were to work with other operating system developers the way Microsoft works with itself, we'd see operating systems with magic features for Netscape to take advantage of. Then customers would *really* have to consider the options. Heck, somebody might even get fired for choosing Microsoft.

This plan requires that Netscape build software so good, so effective, that no matter which operating system it ran on, customers would buy it. If Netscape pulled this off, it would surely become, if not the next Microsoft, the company that gated everything Microsoft did.

I understand why Netscape officials think it would be suicidal to shun Windows and NT in favor of Unix and, gulp, Mac OS. But does the company really have to make all its platforms absolutely equal? Simply reminding customers early and often that Unix is a good choice for an Internet server would be a start. Maybe non-Microsoft operating systems could get top billing on the Netscape home page — the way American Airlines used to list its flights first on its Sabre reservations system.

Netscape also could get behind Apple's fledgling server business. (Apple's Network Server is supposedly a screamer, but does anybody know this besides Apple employees and a handful of analysts?)

Finally, Netscape could make Unix the first test bed for its more experimental features, ensuring that IS departments trying to keep up with the latest betas have at least one Unix server around.

And no, I don't think this is discrimination. I know affirmative action is unpopular in some circles these days, but this is one place where it really makes sense. Call it enlightened self-interest.

Coursey is an analyst, consultant and editor of "coursey.com," an online newsletter at www.coursey.com. He plans to trick-or-treat dressed as Mozilla, the Netscape mascot, before changing into a Microsoft Bob costume. His E-mail address is david@coursey.com.

Java, Java . . . everywhere?

Every time network computing advocates pop up with another cigar-box-thin client, they say it will run Java applications. What Java applications? There are no end-user Java applications in sight. Well, I take that back. J Stream in Vancouver, Wash., recently showed me a word processor that was "compelling for the network computer," said Dennis McNannay, J Stream's vice president.

How did his firm happen to produce a Java word processor? I asked.

"We missed the browser market," McNannay said. I'm missing the Java applications market.

Corel promises a Java version of WordPerfect and is demonstrating it at industry shows. But demos and reality are two radically different things. Your network computer could turn to rust before a Java office suite shows up.

In desperation, I turned to Microsoft, king of desktop applications. Microsoft has been feeling magnanimous of late. It's willing to fund third-party Macintosh developers to prevent Apple from going out of business, according to *The Wall Street Journal*. (Microsoft denies the story.) Surely, I thought, it would support the Java network computer.

I'd been getting reports for months about the legions of Java programmers that Microsoft was hiring. "I've heard Microsoft employs 2,000 Java programmers," I told Mary Anderson, director of market development at SunSoft recently. "It's 2,200," she corrected me without hesitation.

But when I bounced that number off Cornelius Willis, group product manager for Internet development tools at Microsoft, he said, "That's wacko."

"That would mean one in every eight Microsoft employees was a Java programmer," Willis said. The way he said it convinced me it was more likely that one in every eight Americans was a telephone operator.

"Is Microsoft creating Java desktop applications?" I asked Willis. Getting an answer was like asking a coyote to part with his coat. Java is a pretty good language, Willis said. "But you don't get a lot of things that you'd expect," such as APIs for audio, QuickTime video or Direct Draw.

"Is Microsoft working on Java versions of its applications?" I asked again.

Microsoft's just-in-time compiler for Java was the best out there, "five times faster than Symantec's," Willis answered.

"But what about applications?" I persisted.

"No," he said. *Finally!* "There's no effort under way" to create Java versions of Microsoft applications. "We're in the investigative stages right now."

At that bad news, I gave up the search. There are Java development tools and compilers sprouting all over. There are impressive Java applications in manufacturing, sales force automation and help desk management. But standard desktop applications in Java are still a ways off.

By the time I get the energy to renew my search, intranets will have crept into most organizations; the applications written for them will use Java and will look nothing like the applications we have today. They will continuously update themselves with fresh source code. They will download information sought by their users from the Internet and will deliver the programming that's needed with data.

Java will give birth to a new breed of applications that make better use of networks. If I were Microsoft, I would investigate further.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

The Back Page

In the spirit *of Ken Kesey and Jack Kerouac, four Web developers set off in a Volkswagen bus early this month for a West Coast road trip. Their mission: to study Internet culture with man-on-the-street interviews. Check out the merry adventures of the neo-beatniks in the diary posted at* **alt.mcafee.com.**

Trying to personalize *your little corner of cyberspace? Zelco Industries in Mount Vernon, N.Y., offers the Computer BudVase for $13. This clever accessory has a flexible arm and suction cup that attaches to your computer or monitor and comes with a stand-alone base.*

alt.cw

In March, static electricity apparently caused an election computer to miscount results of a Polk County, Ore., tax measure. After officials sprayed the carpet around the computer with Downy Fabric Softener, the tax proposal passed, *The Wall Street Journal* reported.

An automated toll collection system tested by the California Department of Transportation was deemed a failure because it couldn't achieve the required 99.95% success rate, the *San Francisco Chronicle* reported. The system could do no better than 99.1% because it had trouble distinguishing among different types of multiwheel vehicles to charge the correct toll.

Investigators said American Flight 965 crashed into a Colombian mountain last December because a pilot entered the wrong code into the autopilot computer. The plane was supposed to fly to "Rozo" radio beacon. But the pilot accepted the first entry in the database of "R" beacons, which was the "Romeo" beacon, more than 100 miles and 90 degrees in the wrong direction.

A data entry error sent a surprise gift of $320,000 in mutual funds to investor Roger Harris in April, *The Wall Street Journal* reported. A bank clerk wiring funds from a corporation to Invesco Funds Group in Denver mistakenly typed Harris' old Invesco account number. (Harris returned the funds.)

Tasty Fries in Blue Bell, Pa., has developed a vending machine that cooks and dispenses freshly cooked french fries in about a minute. Inside the machine is a patented robotic arm that dips the fries in to hot oil.

Inside Lines

Lockheed revisits Mac attack

Another operating systems warhead is about to be launched at Lockheed Martin Missiles & Space in Sunnyvale, Calif. IS management at the world's second-largest Macintosh site is again proposing standardizing on Wintel. In 1995, an uprising among Macintosh users dissuaded management from abandoning the Macintosh. This time, however, Apple users aren't being given much of a chance to voice their opinions. A decision is expected by the first of the year, Lockheed sources said. One Lockheed insider said that "management already knows what the users want, and they just don't care to hear it again."

Speaking of Apple and armaments

Anchorhunk Tom Brokaw was in Hartford, Conn., last week covering the presidential snooze-athon until late Suoday night, but he managed to appear sharp as a tack at 9 a.m. in Orlando, Fla., the next day. He moderated the keynote panel at last week's Gartner Group infofest. At one point, while Apple CEO Gilbert F. Amelio was whining about Wintel domination, Brokaw jumped in and asked Amelio what Apple could realistically do to stop Microsoft. Amelio's respoose: "nuclear weapons."

They've got the tools

Informix Software plans next week to announce remote management tools and expanded replication capabilities that will be bundled with upcoming releases of its relational databases, according to sources close to the company. The tools will also include support for administering its databases from Web browsers. The features will first appear early next year.

Digital readies 600-MHz chip

Digital is getting set to reveal technical details for a superfast Alpha chip. More information about the chip, which may reach speeds of 600 MHz, is expected to trickle out at the upcoming Microprocessor Forum seminar in San Jose, Calif., according to sources close to the company. Meanwhile, the company is reportedly on schedule for a first-quarter 1997 release of the low-cost 21164PC chip that it is jointly developing with Mitsubishi of Japan.

Strategy shift at Tandem

Tandem Computers has scheduled a major announcemeot for the week of Oct. 30. Analysts speculate that the high-end server vendor may be hitching its fortunes closer to the Wintel bandwagon with a line of highly-scalable Windows NT servers based on Intel's Pentium Pro chips. The servers will incorporate Tandem's ServerNet cluster interconnect technology.

Lotus plans Web software

Lotus this week will announce a family of software products based on its Net.Apps line of Web applications. Net.Apps lets users build applications to easily create and improve Web pages without requiring any programming on Lotus' Notes platform. The planned products will build on the Net.Apps framework and will expand Lotus' Web strategy beyond corporate customers to include general consumers.

Although IBM now sells StorageTek's Iceberg mainframe disk arrays under its own Ramac brand name, loyal Iceberg users can't get used to sleeping with the former enemy, as it were. So at Forum, StorageTek's annual user conference, attendees took to calling IBM's Ramac Virtual Array Storage by a catchier name — "Ramberg." If you have any news tips to share, don't be shy about contacting Computerworld's own Rambo, news editor Patricia Keefe, at patricia_keefe@cw.com or (508) 820-8183.

DATA WAREHOUSING WITHOUT A GOOD PLAN CAN GET REAL UGLY.

In the rush to implement functiooal data warehousing, many companies have instead created one dysfunctional patchworked database. Which ultimately leads to oothing but paio.

Cayeooe has a somewhat more saoe solutioo. A set of tools that allow you to extract your existiog data structures by reverse engineering them into logical business models, aod then forward engineeriog them into a physical warehouse design.

This is not some medieval CASE model. It's ao adaptable, fluid architecture that lets you stay on top of the meta data, so you can evolve and update across the enterprise as data query aod analysis requirements change.

Don't let your data warehouse become another borror story.

Call us at 1-800-285-7294 or visit our web aite, www.cayenoesoft.com, for a white paper oo data warebousiog architecture.

KEEP DATA WAREHOUSING BEAUTIFUL.

Please send me your guide "Data Warehousing: A Fluid Architecture."

Name _____

Title _____ Company _____

Address _____

City _____ State _____ Zip _____

Tel _____ E-mail _____

1-800-285-7294 Fax: 617-229-9904

www.cayennesoft.com

Cayenne Software Inc., 8 New England Executive Park, Burlington, MA 01803

Cayenne

SOFTWARE, INC

A Bachman and Cadre Company

Cayenne is a trademark of Cayenne Software, Inc. Blair Kerkoff licensed by Kerkoff Enterprises. Represented by The Roger Richman Agency, Inc., Beverly Hills, CA 90212.

Here's the deal: you get a sleek, fast, copy of Seer/7000 application development tools to try for 60 days, and if you don't like it, you give it back. Period. Don't worry; we think you'll like it. For starters, it brings the technology behind our strategic fancy Italian sports cars. It also features sophisticated middleware that hides complex translations and a conference-based development repository that speeds construction, along with enhanced flexibility and superior functionality. And it lets you use the resources of existing servers – even mainframes.

It's kinda like having a Ferrari dropped off at your office for a couple of weeks. *No Questions Asked.*

enterprise tools to department-level projects. It lets you build on a Windows NT platform and deploy to everything from mainframes, midrange systems, UNIX servers and PC LANs. And, best of all, it's a lot more affordable than those

It is, in short, powerful and flexible enough to take you places your current development tools can only dream of. To see how far and fast you can go, call 1-800-499-SEER or visit us at www.seer.com.

Microsoft SOLUTION PROVIDER

Seer is a registered trademark, and the Seer logo and Seer/7000 are trademarks, of Seer Technologies, Inc. All other product and company names mentioned herein are for identification purposes only and are the property of, and may be servicemarks, trademarks, or registered trademarks of their respective owners. Copyright© 1996, Seer Technologies, Inc. All rights reserved.

SEER®